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ABSTRACT

        Sixteen Texas projects for handicapped infants
participated in a study to determine followup service placement of
project graduates and cost of early intervention. Analysis of
completed survey forms indicated that an overall success rate for
finding children after graduation from a project was 81% of the total
attempted. For more than three-fourth of the graduates, followup took
place within 3 years after leaving the project. Data is presented on
sex, ethnicity, functional impairment, and primary handicap.
Seventy-seven percent of the graduates followed were attending a
public school, while only 4% were in a residential program, despite a
relatively high percentage (approximately 20%) of students rated as
severely impaired at program exit. No relationship of consequence was
found between place of service and type of agency sponsoring the
project or between place of service and primary handicap of the
child. Analysis of cost information was based on figures for salaries
and consultant fees and revealed an average personnel cost per child
per year of $2,147. Wide extremes in cost per child and in personnel
resources expended per child were found among the projects. (CL)

TRIPLE T INFANT CONSORTIUM
FOLLOWUP STUDY

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and

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Prepared for the Teaching Texas Tots

Consortium for Handicapped Infants

Fall 1980

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Triple T Infant Consortium

Teaching Texas Tots - Consortium for Handicapped Infants

The opinions expressed herein do not necessarily reflect the positions or policies of the Triple T Infant Consortium or the Texas Education Agency or the U. S. Department of Education, and no official endorsement should be inferred.

Acknowledgment

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1980 Triple T Consortium Officers.

President . . . . Meredith Dixon
                          Garland, Texas

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Introduction

The Triple T Infant Consortium (Teaching Texas Tots - Texas Consortium for Handicapped Infants) was formed in May 1976 and has assumed an advocacy roll for handicapped infants in the State of Texas. A major goal of the Consortium is the establishment of free and appropriate educational programs for handicapped infants. The purposes of the Consortium are as follows:

1. To increase the awareness of the importance of intervention programs for handicapped infants.

2. To provide an overview of the state of the art in infant programming, including program models, research outcomes, and legislative trends.

3. To develop future directions for programs for handicapped infants. The major focus of the Consortium is handicapped infants and toddlers aged birth through two years.

The founding members of the Consortium basically consisted of Texas early intervention projects funded either by the Texas Education Agency or the Handicapped Children's Early Education Program (HCEEP) administered by the Bureau of Education for the Handicapped in the former U. S. Office of Education. Today the membership in the Consortium is open to any person involved or interested in early intervention for handicapped children. The Consortium membership represents a wide range of institutions including state centers for mentally retarded people, public schools, private and nonprofit service agencies, community centers, special projects, and other service providers.

Background for the Study

The Triple T Infant Consortium Followup study was the second research effort undertaken by the Consortium. The first research study, completed in 1978, described services provided by member projects and reported cost figures for early intervention for handicapped infants and toddlers (Macy Research Associates, 1978). The study concluded that project intervention improved developmental progress of handicapped children. Like the first research study, this second effort sought to provide information about the impact of early intervention which could be useful for policy formation in the area of special service for handicapped infants and toddlers.

Research reported within the last several years has supported the conclusion that early intervention for handicapped children is effective. Bricker and Bricker (1972) and Phillips and Balthazar (1979) found that without intervention, language development in severely handicapped children deteriorated over time. Other researchers reported finding a consistent trend downward in developmental progress of retarded infants and children, when intervention was not provided (Cornwell and Birch, 1969; Dicks-Mireaux, 1972; Carr, 1970).

The primary focus of the current followup study was on the service placement of infants and toddlers after graduation or exit from early intervention. Major questions regarding followup service placement concerned the location or institution providing service, if any, and the type of service placement used for service delivery. For example, how many early intervention graduates went on to attend a public school? How many of these were enrolled in a self-contained special education classroom?

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A secondary focus of the current study was the cost of early intervention for handicapped infants and toddlers. Major questions in the cost portion of the study dealt with estimates of the annual cost per child and the extent of personnel resources per child. Previous research in Texas concerning the cost of early intervention found that the median annual (12 months) cost per child was $2,272, with great variability among projects in terms of cost per child (Macy Research Associates, 1978, p.110). Cost figures from a national sample of seven projects in the National Diffusion Network (NDN) indicated that the median annual cost per child was $1,995 (Far West Laboratory for Educational Research and Development, 1979, pp. 5-8, 5-35, 5-37, 10-19, 10-21, 1-25, 10-29).

The political context of early intervention for handicapped infants and toddlers in Texas emphasized the importance of the followup study. Both lay and professional opinion had been growing in recent times, and there was strong support for early intervention. Recent legislation had mandated special services for blind and deaf children from birth onward, while special services for other handicapped children were mandated at age three years.

Proposed legislation addressing special services for birth through two handicapped children (and perhaps more generally birth through five years) was expected to come before the next session of the Texas legislature, and Triple T Consortium members hoped that this study would provide timely and important input to policy formation at the state level. A recent series of public hearings held by an interim study committee of the Texas Senate provided an added forum for advocacy and input, and public interest and involvement were high.

3.

Participating Projects

The early intervention projects invited to participate in the study were those represented by the membership in the Triple T Consortium. As determined from the Consortium membership files, members represented 20 early intervention projects. The Consortium president sent an advance letter to members explaining the nature of the study and encouraging members to participate. Announcement of the study was publicized also in the

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"THE EARLY INTERVENTION PROJECTS INVITED TO PARTICIPATE IN THE STUDY WERE THOSE REPRESENTED BY MEMBERSHIP IN THE TRIPLE T CONSORTIUM."

Consortium's newsletter, the Circuit Writer. Researchers talked with personnel from 19 of the 20 potential projects to explain details of the study and to verify participation in the study. (One project director could not be reached within a reasonable time period.)

A total of 16 of 19 projects contacted (84%) agreed to participate, and the following lists these by location and name:

Abilene	West Texas Rehabilitation Center
Amarillo	State Center for Human Development, MHMR
Austin	Infant Parent Program, MHMR
Corpus Christi	Bay to Bay Infant Project, MHMR
Dallas	Callier Center
Dallas	Project FIND, DARC
Dallas	Project KIDS, Dallas ISD
Farmers Branch	Special Care School

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Ft. Worth	Project TASK, Tarrant Co. Easter Seal Society
Garland	Project PIP, Garland ISD
Houston	Harris Co. MHMR
Longview	Project FAITH, Longview ISD
Lubbock	Family Link, Texas Tech University
Lubbock	DEBT Project, Lubbock ISD
Richardson	Richardson Development Center
Silsbee	Project SEARCH, Silsbee ISD

Inspection of the 16 projects sampled showed that four were operated within mental health/mental retardation (MHMR) centers, under the auspices of the Texas Department of Mental Health/Mental Retardation, and five were operated in independent school districts (ISD), under the auspices of the Texas Education Agency. The remaining seven were operated by either private centers or nonprofit organizations. All projects were involved actively in service

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"A TOTAL OF 16 OF 19 PROJECTS CONTACTED (84%) AGREED TO PARTICIPATE..."

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delivery to the birth through two-year handicapped population. Several projects also provided for services after age three years, as well.

Sampled projects were selected nonrandomly from the population of Texas infant projects, and the sample (N=16) included about 20% of all such projects in the State. More than one-half the sampled projects provided services for eleven or twelve months of the year, while the least number of months of service provided was nine. The typical number of months of service available for the MHMR projects was 12 months, with 10

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months for the ISD projects. Service availability for the remaining projects ranged from 9 to 12 months. The numbers of children served (1979-80) ranged from 9 to 390, and the median number served was 41 children.

A major consideration in research is the issue of generalizeability. Research results which are unique to a particular setting or situation have limited value, and results are useful to a wider audience if they are relevant beyond the time and setting of the original study. While the decision to generalize results is the responsibility of the consumer of research, it is the researcher's responsibility to describe the study so that the consumer has the information necessary for intelligent generalization. Accordingly, Table 1 reports descriptive information about the projects' sponsoring agencies in terms of the number served, age range served, months of service, staff size, and total budget. Since the study sampled a significant proportion (20%) of the population of infant projects in Texas, and since the sample represented a wide range of sponsor agencies, the sample was considered fair and reasonable.

Data Collection Procedures

Data collection in the study included two single-page survey forms. One form solicited descriptive cost information about the participating project, and the second asked for followup information on individual children. The Appendix includes a specimen set of forms and standard instructions to participants.

The Cost Analysis Form requested information about direct personnel costs in terms of the types of personnel positions and the percent of time committed to birth through two children. Additionally, the cost form

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Table 1

Descriptive Data for Agencies Sponsoring Sampled Early Intervention Projects

Agency Type	Project	Number Served (1979-80) Birth-2 yrs.	3-22 yrs.	23 Yrs.+	Months of Service (0-2 yrs.)	Staff Size (all ages) Professional	Paraprofessional	Total Budget (all ages)
MHMR	1	45	116	469	12	46[a]	8	$ 2,185,031
	2	130	-	-	12	8[a]	10[a]	332,517[a]
	3	36	56	125	12	4[a]	4[a]	82,312[a,b]
	4	284	-	-	12	25[a]	0[a]	600,000[a]
ISD	5	85	10,706	0	9	804	144	15,785,305
	6	35	4,000	0	10	207	81	4,625,000
	7	13	782	0	12	60[a]	32[a]	1,000,000[a]
	8	202	4,200	0	10	4[a]	3[a]	95,000[a]
	9	22	444	0	10	24	12	609,500
PNP[d]	10	390	2,210	3,900	12	56	32	2,245,000
	11	29	-	0	11	13	6	277,218
	12	115[c]	0	0	12	4	0	83,000
	13	9	32	5	11	10	10	301,000
	14	180	360	465	12	16[a]	2[a]	1,100,000
	15	23	0	0	9 1/2	5[a]	1/2[a]	83,778[a]
	16	15	11	0	9	2[a]	3[a]	110,000[a]

[a] Reported figures were limited to birth to 2-year children.

[b] Value may have been in error, since it was less than the total annual personnel costs computed for project #3 (Table 27).

[c] Population served was birth to 3 years, rather than birth to 2 years.

[d] Private Nonprofit.

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asked for descriptive information about the agency sponsoring the partici-
pating project in terms of number and age of clients served, number of months

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_ "DATA COLLECTION IN THE STUDY INCLUDED...COST INFORMATION
ABOUT THE PARTICIPATING PROJECT AND...FOLLOWUP INFORMATION ON
INDIVIDUAL CHILDREN."

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of service per year, staff size, and total budget.

In addition to the cost form, data collection included a Child Followup
Study Sheet for each child for whom followup was attempted. Directions to
projects specified the completion of a followup sheet for each child who met
the following criteria.

 1. Received at least six months of _continuous_ intervention at some
     time during his or her enrollment in the project.

 2. Was three years or older as of September 1, 1980 and therefore
     was too old to have been eligible for a birth through two pro-
     gram or setting.

The criteria for followup eligibility allowed selection of any child served
at any time in the history of a project, assuming six-months of continuous
service and the specified age limitation. Six months was selected as a
minimum length of treatment necessary for some degree of intervention effect.
The length of treatment for individual children (i.e., duration of project
enrollment) was not collected in order to minimize the data collection task.
Length of treatment was assumed to have been a random effect and to have
had no significant variation among projects. In other words, the assumption
was that no single project or group of projects was more likely to attempt
followup for children who were significantly different from other children
in terms of length of treatment.

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All participating projects received a standard set of data forms and instructions for completion. As noted previously, projects were contacted by telephone, and these materials were discussed at this time. Instructions regarding the followup portion of the study directed personnel to perform three basic steps. These were:

1. Identify all children who meet the criteria for followup eligibility.

2. Determine the whereabouts of the above children and identify services currently being received.

3. Complete a Child Followup Study Sheet for each of the above children.

Since the followup sheet allowed for information ranging from unknown to complete placement description, the extent of completeness in the followup sheets varied across children. All information on the followup sheet was reported anonymously.

Two major information items contained in the Child Followup Study Sheet were the date of exit from the project and the followup status. The date of exit from the project was recorded in terms of month and year, and was taken as the date of either exit or graduation from the project. No criteria were defined for project graduation, and the term graduation was assumed to have been synonymous with the term project exit. The followup status included four categories: unknown, moved out of area, deceased, and located. If followup status was equal to any of the first three categories, no additional information was collected for the child. When a child was located, the followup sheet requested information about the date of the current or last known placement, place of service and type of service placement, sex, ethnicity, handicapping conditions, and functional impairment.

If a project served children three years and older, determination of the whereabouts of children for followup was no doubt easier, since many children were likely in the same project. In these cases, the current project placement was the followup placement for those children who had graduated from the birth through two component of the project.

Budget for the study did not allow for on-site visitation and data collection, so data collection procedures relied necessarily on the assistance and cooperation of project personnel. Accordingly, the design of the study attempted to define that data which would be most useful from a research perspective but still would be within the resources and commitments of participating projects. Therefore, some data which would have been useful, such as

"...THE DESIGN OF THE STUDY ATTEMPTED TO DEFINE THAT DATA WHICH WOULD BE MOST USEFUL FROM A RESEARCH PERSPECTIVE BUT STILL WOULD BE WITHIN THE RESOURCES AND COMMITMENTS OF PARTICIPATING PROJECTS."

date of birth, length of treatment, or more detailed descriptions of service placements of the children followed, were not collected in order to keep the data collection task within acceptable limits.

Results of Followup

This section of the document describes results of the followup of early intervention graduates relative to success in locating children. It includes also a demography of located children and descriptions of place of service and types of service placement experienced by early intervention graduates.

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Followup Success Rate

Personnel in fifteen of the sixteen sampled projects attempted to followup children who had graduated (or exited) previously from their project. One project opted not to provide followup data because of staff limitations and time constraints.

The first step for each project was to identify those children who met the criteria for followup, and the second step was to determine the whereabouts of those children and to identify the services being provided. Table 2 reports the number of children eligible for followup and the number for whom followup was attempted. These data show that a total of 1,204 children met the followup criteria and that followup was attempted for 1,044 of these children (87%). Footnotes to Table 2 also indicate the restrictions reported by selected projects for determining the population for attempted followup.

Further inspection of Table 2 shows that twelve of the fifteen projects attempted followup for 100% of the eligible populations. The ISD projects attempted followup on all eligible children, and the MHMR projects attempted followup on 80% of those eligible within their projects.

"...A TOTAL OF 1,204 CHILDREN MET THE FOLLOWUP CRITERIA AND THAT FOLLOWUP WAS ATTEMPTED FOR 1,044 OF THESE CHILDREN (87%)."

Of the 1,044 children for whom followup was attempted, the ISD projects accounted for 49% (N=517), and the MHMR projects accounted for 36% (N=375).

The private or nonprofit (PNP) projects accounted for only 15% of the total attempted followup population. As indicated in Table 1, most

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Table 2

Number of Children Involved in Followup

Agency Type	Project	Met Eligibility Criteria		Attempted Followup		Percent Attempted
MHMR	1	25		25		100
	2	207		207		100
	3	59		59		100
	4	175[a]		84		48
	Subtotal		466		375	80%
ISD	5	108		108		100
	6	74		74		100
	7	63		63		100
	8	200		200		100
	9	72		72		100
	Subtotal		517		517	100%
PNP	10	–				
	11	58[b]		58		100
	12	32		32		100
	13	40		16[c]		40
	14	29		29		100
	15	50		7[d]		14
	16	10[e]		10		100
	Subtotal		222		152	68%
Total			1,204		1,044	87%

[a] Reported number was 150-200.

[b] Population limited to most recent three years.

[c] Randomly selected from the eligible population.

[d] Sample restricted to most immediate and accessible files.

[e] Population limited to most recent year.

of these projects limited their eligible followup population to very recent years or sampled from the eligible population.

Results of followup showed that personnel were able to locate about 78% of those children for whom followup was attempted. This was 819 children out of the 1,044 attempted. About 8% had moved out of the project's area, 2% were deceased, and the whereabouts of 12% were unknown. Table 3 reports these data and shows that followup results were remarkably consistent across the type of agency sponsoring each project, especially in terms of the percent located.

Table 3 shows also that the percent located ranged from 54.1% to 100.0% across projects, and the correlation between the number attempted for followup and the percent located was -.04, which indicated no relationship. The absence of a relationship between number attempted for followup and the percent located suggested that the number of children selected for

"RESULTS OF FOLLOWUP SHOWED THAT PERSONNEL WERE ABLE TO LOCATE ABOUT 78% OF THOSE CHILDREN FOR WHOM FOLLOWUP WAS ATTEMPTED...8% HAD MOVED...2% WERE DECEASED...12% WERE UNKNOWN."

followup did not affect followup success. Presumably, other factors such as accuracy of project records and ambition of staff determined success in locating project graduates. The interested reader may consult Table 4 for a report of followup results in terms of numbers of children.

A major issue in the conducting of any followup study is the success of locating members in the intended population. In followup studies of high school graduates, it is not uncommon to experience success rates of 30% or even lower. In the current study, 78.4% were located, and 2.2% were

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Table 3

Followup Results in Terms of Percent Attempted

Agency Type	Project	Number Attempted	Followup Status			
			Located	Moved Out of Area	Deceased	Unknown
MHMR	1	25	88.0%	0.0%	0.0%	12.0%
	2	207	77.8%	12.6%	6.3%	3.4%
	3	59	91.5%	5.1%	0.0%	3.4%
	4	84	60.7%	0.0%	1.2%	38.1%
	Subtotal	375	76.8	7.7	3.7	11.7
ISD	5	108	69.4%	11.1%	2.8%	16.7%
	6	74	54.1%	27.0%	0.0%	18.9%
	7	63	82.5%	3.2%	6.3%	7.9%
	8	200	98.5%	1.0%	0.5%	0.0
	9	72	66.7%	12.5%	1.4%	19.4%
	Subtotal	517	79.7	8.7	1.7	9.9
PNP	10	—				
	11	58	82.8%	6.9%	0.0%	10.3%
	12	32	68.8%	9.4%	0.0%	21.9%
	13	16	75.0%	0.0%	0.0%	25.0%
	14	29	69.0%	0.0%	0.0%	31.0%
	15	7	100.0%	0.0%	0.0%	0.0
	16	10	100.0%	0.0%	0.0%	0.0
	Subtotal	152	78.3	4.6	0.0	17.1
Total		1,044	78.4	7.8	2.2	11.6

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Table 4

Followup Results in Terms of Numbers
of Children (N=1,044)

Agency Type	Project	Located	Moved Out of Area	Deceased	Unknown
MHMR	1	22	0	0	3
	2	161	26	13	7
	3	54	3	0	2
	4	51	0	1	32
	Subtotal	288	29	14	44
ISD	5	75	12	3	18
	6	40	20	0	14
	7	52	2	4	5
	8	197	2	1	0
	9	48	9	1	14
	Subtotal	412	45	9	51
PNP	10	-			
	11	48	4	0	6
	12	22	3	0	7
	13	12	0	0	4
	14	20	0	0	9
	15	7	0	0	0
	16	10	0	0	0
	Subtotal	119	7	0	26
Total		819	81	23	121

deceased, for a total of 80.6%. These results revealed one benefit to conducting followup of early intervention. The graduates can be located.

One would of course expect early intervention graduates to have been more accessible for followup since the options following graduation were greatly restricted, especially when compared to high school or adult programs. Results from the current study provided at least one estimate of the expected success rate in early intervention followup study. A 99% confidence interval computed about the observed success rate of 81% (included percent located and percent deceased) ranged from 84% to 78%, and other researchers might expect comparable followup success rates.

The confidence interval for the followup success rate (81%) was computed according to the method described by Hays (1963, p.291), where the interval was equal to $P \pm 2.58 \sqrt{PQ/N}$.[a] The interpretation of such an interval is that if 100 samples of N=1,044 were to be drawn randomly from the hypothetical population randomly sampled by the current study, and if a confidence interval were to be computed similarly for each sample; 99 of the 100 intervals would contain the percent of located or deceased children in the hypothetical population.

One obvious explanation for the high followup success encountered in this study was the continuity of intervention across birth through elementary school. If the child's family continued to reside within a project's area, either the family or major service providers could be contacted to determine a child's whereabouts. Several projects or sponsoring agencies included in the current study provided services across the birth

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[a] P = the proportion of children in a public or parochial school, and Q = the remaining proportion; N = 802, total children and 2.58 is the z-value associated with the probability of .01 under the normal curve.

to six-year age range, and so followup was especially easy for those children who had continued in the project after "graduating" from the birth through two component.

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"FOR MORE THAN THREE-FOURTHS OF THE CHILDREN, FOLLOWUP TOOK PLACE WITHIN THREE YEARS (36 MONTHS) AFTER PROJECT EXIT."

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Another factor influencing success of followup was the time since exit from the project. Presumably, followup of children ten or fifteen years after exit from a project would be less successful than followup conducted shortly after project exit. Analysis of reported dates of exit for 985 of the 1,044 for whom followup was attempted (94%) found that followup was conducted within a few years after project exit. For more than three-fourths of the children, followup took place within three years (36 months) after project exit. Table 5 reports the percent of children followed in terms of the number of months since project exit.

Table 6 presents the median date of exit for followed children and the number of months from time of followup to the median exit date. These data showed some differences between the 'unknown or moved' children and the 'located or deceased children' in terms of time between followup and project exit. In the ISD and PNP projects, the time from followup to median exit date was somewhat less for 'located or deceased' children; but there was no similar difference for MHMR projects. However, the maximum time from followup to exit was consistently greater for 'located or deceased' children.

Information given in Table 6 showed also that children followed by the ISD projects had been out of a project longer than had children fol-

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Table 5

Percent of Children Followed in Terms
of Number of Months Since Project Exit

Agency Type	Unknown or Moved Out of Area						Located or Deceased					
		Months						Months				
	N	12	24	36	48	60+	N	12	24	36	48	60+
MHMR	72	28%	43	8	6	15	301	35%	33	11	7	14
ISD	75	9%	20	24	43	4	388	34%	18	18	17	13
PNP	32	6%	44	41	6	3	117	39%	28	23	7	3

Table 6

Median Dates of Exit and Months from Exit to Followup[a]

| Agency Type | N | Unknown or Moved Out of Area | | | | N | Located or Deceased | | | |
| | | Median Exit Date | Months from Exit to Followup | | | | Median Exit Date | Months from Exit to Followup | | |
			Mediam	Maximum	Minimum			Median	Maximum	Minimum
MHMR	72	July 79	15	49	2	301	July 79	16	73	1
ISD	75	Nov 77	34	57	3	388	May 78	28	83	1
PNP	32	Aug 78	25	49	7	117	June 79	15	58	1

[a]Date of followup was assumed to have been constant for all projects, even though actual dates varied by one or perhaps two months.

lowed by MHMR or PNP projects. In the case of the PNP projects, an explanation for this difference was readily apparent since three of these six projects limited their followup to the most recent previous years.

"...CHILDREN FOLLOWED BY ISD PROJECTS HAD BEEN OUT OF A PROJECT LONGER THAN HAD CHILDREN FOLLOWED BY MHMR OR PNP PROJECTS."

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and two of the remaining projects did not begin services until after the fall of 1977.

An explanation for the observed difference between MHMR and ISD projects in terms of the time between followup and project exit was not immediately evident. Four of the five ISD projects began in the fall of 1975, and the fifth project began one year earlier. The oldest ISD project (1974) contributed 39% of the ISD children for whom ISD projects attempted followup. One MHMR project began in the fall of 1973, and this project contributed 55% of the children for whom MHMR projects attempted followup. However, a second and third MHMR project did not begin until the summer of 1976 and spring of 1977. The fourth project, which contributed 22% of the children for whom MHMR projects attempted followup, opted to followup children from only the most recent two years. These results did not indicate that ISD and MHMR projects differed in terms of longevity of service, and there was no clear explanation why the time between followup and project exit was less for MHMR projects.

Demography of Children Located in Followup

One critical piece of information necessary for generalization of results is a description of the subject population. The subjects to be

described in the current study were the 819 children located by the follow-up. There was no attempt to collect descriptive information for all the children who met the followup eligibility criteria (N=1,204) or even for all those for whom followup was attempted (N=1,044), so as to reduce the burden of data collection on participating projects (see footnotes to Table 2).

Of the 819 children located by the followup, the information about the gender of the children was reported for 785 (96%) children and about the ethnicity for 772 (94%) children. Table 7 reports the gender informa-tion in terms of number and percent of children, and these data revealed that 55% (N=431) of the children located were male. While the percent male was very consistent across the type of sponsor agency, the percent male ranged from 40% to 66% across individual projects.

Information regarding ethnicity of located children is reported in Table 8, and these data show that overall 51% of located children were of Anglo ethnicity. Of the remaining children, 20% were Black, 28% were Hispanic, and 1% was of other ethnic background. Across individual pro-jects, the percent Anglo ranged from 24% to 100%, percent Black ranged from

"...REVEALED THAT 55% (N=431) OF THE CHILDREN LOCATED WERE MALE...51% OF LOCATED CHILDREN WERE OF ANGLO ETHNICITY ...20% WERE BLACK...28% WERE HISPANIC...."

0% to 65% and percent Hispanic ranged from 0% to 74%.

Information about the primary handicapping condition was reported for 793 of the 819 located children (97%). These data indicated that mental retardation, language delay, developmental delay, and orthopedic

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Table 7

Gender of Children Located in Followup

Agency Type	Project	Total	Male		Female	
			N	%	N	%
MHMR	1	22	10	45.5	12	54.5
	2	153	86	56.2	67	43.8
	3	54	26	48.1	28	51.9
	4	47	31	66.0	16	34.0
	Subtotal	276	153	55.4	123	44.6
ISD	5	68	39	57.4	29	42.6
	6	40	22	55.0	18	45.0
	7	51	26	51.0	25	49.0
	8	189	107	56.6	82	43.4
	9	48	24	50.0	24	50.0
	Subtotal	396	218	55.1	178	44.9
PNP	10	-				
	11	46	27	58.7	19	41.3
	12	20	8	40.0	12	60.0
	13	12	6	50.0	6	50.0
	14	18	9	50.0	9	50.0
	15	7	4	57.1	3	42.9
	16	10	6	60.0	4	40.0
	Subtotal	113	60	53.1	53	46.9
Total		785	431	54.9	354	45.1

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Table 8

Ethnicity of Children Located in Followup

Agency Type	Total	Anglo		Black		Hispanic		Other	
		N	%	N	%	N	%	N	%
MHMR	276	117	42.4	44	15.9	114	41.3	1	0.4
ISD	385	201	52.2	97	25.2	84	21.8	3	0.8
PNP	111	76	68.5	17	15.3	17	15.3	1	0.9
Total	772	394	51.0	158	20.5	215	27.8	5	0.6

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handicap accounted for about three-fourths of all primary handicaps.
Table 9 describes the located children in terms of primary handicap. In-
spection of Table 9 reveals considerable variability across individual
projects.

The variability among projects in terms of primary handicap could
have been due to several factors, one of which could have been mere sam-
pling variation. Another factor could have been variability in appraisal/
placement criteria. The classification of developmental delay was one area

"THE VARIABILITY AMONG PROJECTS IN TERMS OF PRIMARY
HANDICAP COULD HAVE BEEN DUE TO SEVERAL FACTORS..."

where there could have been considerable variability among projects, since
the definition of developmental delay was not well standardized among pro-
fessionals. In some cases, project service models emphasized one or a
few handicapping conditions, and this accounted for some of the observed
variability. This was more typically true for the PNP projects and likely
not true for the ISD projects, which were under state and federal mandates
to provide a full range of services.

Followup results showed also that many located children possessed
multiple handicapping conditions. These children had one or more handicaps
in addition to the primary handicapping condition. Table 10 shows that
the number of located children with multiple handicaps (N=504) was 64% of
all children located in the followup.

Computation of the percent of multiply handicapped children
located by each project showed great variability among projects.

Table 9

Primary Handicap of Located Children in Terms of Percent of Total[a]

Agency Type	Project	Total Located	MR	LDL	DD	ORTHO	OHI
MHMR	1	22	59.1	0	18.2	13.6	0
	2	160	1.9	6.3	70.0	8.8	4.4
	3	54	11.1	1.9	68.5	13.0	0
	4	49	46.9	18.4	30.6	2.0	0
	Subtotal	285	15.8	7.0	58.9	8.8	2.5
ISD	5	64	39.1	12.5	10.9	12.5	10.9
	6	40	42.5	27.5	5.0	12.5	7.5
	7	52	50.0	11.5	1.9	21.2	0
	8	188	18.1	17.0	20.2	12.2	18.1
	9	48	6.3	16.7	29.2	0.0	8.3
	Subtotal	392	26.8	16.6	15.8	12.0	12.2
PNP	10	-					
	11	48	0	0	6.3	0	0
	12	19	89.5	0	10.5	0	0
	13	12	58.3	0	33.3	0	0
	14	20	0	0	15.0	20.0	0
	15	7	42.9	0	28.6	28.6	0
	16	10	20.0	40.0	10.0	10.0	10.0
	Subtotal	116	25.0	3.4	12.9	6.0	0.9
Total		793[c]	22.6	11.2	30.9	10.0	7.1

[a]Table 9 is continued on the next page.

[b]
MR = mental retardation
LDL = language delay
DD = developmental delay
ORTHO = orthopedic
OHI = other health impairment

[c]Total is less than 819 due to missing handicap information.

Table 9 (Cont'd.)

Agency Type	Project	Total Located	Primary Handicap (Cont'd.)[a]				
			HI	VH	ED	AU	OTH
MHMR	1	22	9.1	0	0	0	0
	2	160	0	8.1	0	0.6	0
	3	54	3.7	1.9	0	0	.0
	4	49	0	0	0	2.0	0
	Subtotal	285	1.4	4.9	0	0.7	0
ISD	5	64	4.7	6.3	1.6	0	1.6
	6	40	2.5	2.5	0	0	0
	7	52	11.5	3.8	0	0	0
	8	188	5.9	3.2	1.6	0	3.7
	9	48	2.1	0	0	0	37.5
	Subtotal	392	5.6	3.3	1.0	0	6.6
PNP	10	-					
	11	48	93.8	0	0	0	0
	12	19	0	0	0	0	0
	13	12	0	0	0	0	8.3
	14	20	0	0	0	0	65.0
	15	7	0	0	0	0	0
	16	10	0	10.0	0	0	0
	Subtotal	116	38.8	0.9	0	0	12.1
Total		793[b]	9.0	3.5	0.5	0.3	5.0

[a]HI = hearing impaired
VH = visually handicapped
ED = emotionally disturbed
AU = autistic
OTH = other

[b]Total is less than 819 due to missing handicap information.

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Table 10

Number of Located Children with Multiple Handicapping Conditions

Agency Type	Project	Total	Number of Conditions						
			1	2	3	4	5	6	7
MHMR	1	22	2	8	6	2	1	3	0
	2	160	3	64	44	24	19	6	0
	3	54	10	18	14	9	3	0	0
	4	49	29	19	1	0	0	0	0
	Subtotal	285	44	109	65	35	23	9	0
ISD	5	64	45	17	2	0	0	0	0
	6	40	14	12	6	5	3	0	0
	7	52	15	18	13	6	0	0	0
	8	188	81	52	24	17	10	3	1
	9	48	28	19	1	0	0	0	0
	Subtotal	392	183	118	46	28	13	3	1
PNP	10	-							
	11	48	36	12					
	12	19	3	9	5	2	0	0	0
	13	12	1	6	3	0	1	1	0
	14	20	18	2	0	0	0	0	0
	15	7	0	2	4	1	0	0	0
	16	10	4	5	0	0	1	0	0
	Subtotal	116	62	36	12	3	2	1	0
Total		793	289	263	123	66	38	13	1

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This percent ranged from 10% to 100% (see Table 11). In addition, multiply handicapped children were reported more frequently by MHMR projects

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"...THE NUMBER OF LOCATED CHILDREN WITH MULTIPLE HANDICAPS (N=504), WAS 64% OF ALL CHILDREN LOCATED IN THE FOLLOWUP."

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than by the remaining projects. The percent of multiply handicapped children was 53% and 47% for the ISD and PNP projects, respectively, but it was 85% for the MHMR projects.

A chi square value, computed to test the observed frequency of reported multiply handicapped children against the expected frequency among types of sponsor agencies, found that types of agencies differed significantly ($\underline{X}^2$ = 31.72, df = 1, p <.001). The MHMR projects reported significantly more multiply handicapped children than expected, given the number of children located from MHMR projects, and the ISD and PNP projects reported fewer multiply handicapped children than expected.

"...MHMR PROJECTS REPORTED SIGNIFICANTLY MORE MULTIPLY HANDICAPPED CHILDREN THAN EXPECTED...."

There was no conclusive explanation for differences among types of sponsor agencies in terms of reported frequency of multiply handicapped children. One possible explanation was that MHMR projects served more multiply handicapped children than did the remaining projects. An alternative, and presumably less probable, explanation was that staff in MHMR projects were more willing to report handicaps than were staff in the ISD and private or nonprofit projects.

Table 11

Percent of Located Children
with Multiple Handicaps

MHMR			ISD			PNP		
Project	N	Percent MHC[a]	Project	N	Percent MHC	Project	N	Percent MHC
1	22	90.9	5	64	29.7	10	-	
2	160	98.1	6	40	65.0	11	48	25.0
3	54	81.5	7	52	71.2	12	19	84.2
4	49	40.8	8	188	56.9	13	12	91.7
			9	48	41.7	14	20	10.0
						15	7	100.0
						16	10	60.0
Subtotal	285	84.6	Subtotal	392	53.3	Subtotal	116	46.6

[a]MHC = Multiply handicapped.

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Table 12 reports the prevalence of other handicapping conditions (in addition to primary handicap) among located children. Prevalence was understood to mean the occurrence of all cases at a given time, as opposed to incidence which was understood to mean the occurrence of new cases within a given time interval (Marozas, May, and Lehman, 1980), The prevalence reported in Table 12 was cumulated across children because of multiple conditions within individual children.

Inspection of Table 12 indicates that language delay was the most frequent handicapping condition in terms of multiply handicapped children. Developmental delay and orthopedic handicaps were the next most frequent conditions. As in the case of primary handicap, emotional disturbance and autism were very infrequent, as would have been expected with very young children.

Tables 10, 11, and 12 present information regarding multiple handicaps, but another dimension to describing handicapping conditions was the level of functional impairment within developmental areas reported for children at time of exit from a project. Tables 13 through 17 give these data for each of five areas of development: motor, self-care, socialization, cognition, and language.

Inspection of Tables 13 - 17 indicates considerable diversity across individual projects in reported levels of impairment. For example, the percent of children located with no motor impairment (at time of exit from a project) ranged from 0% to 77%, and similar ranges were evident in the developmental areas of self-care, socialization, and cognition. However, the percent with no impairment (at project exit) exhibited much less variability in language development and ranged from 0% to only 31%.

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Table 12

Prevalence of Other Handicapping Conditions Among Located Children[a]

Type	Total N	Handicapping Conditions[b]									
		MR	LDL	DD	ORTHO	OHI	HI	VH	ED	AU	OTH
MHMR	285	13	121	91	53	45	7	21	6	0	6
ISD	392	46	181	43	81	62	13	27	3	1	0
PNP	116	4	91	17	10	8	7	4	0	0	4
Total N		63	334	151	144	115	27	52	9	1	10
%		7.0	36.8	16.6	16.9	12.7	3.0	5.7	1.0	0.1	1.1

[a]Prevalence is cumulated across children due to presence of multiple conditions within individual children.

[b]Handicap condition headings are as in Table 9.

Table 13

Percent of Located Children by Level of Functional Impairment in Motor Development

Agency Type	Project	Total	Level of Impairment			
			None	Mild	Moderate	Severe
MHMR	1	22	9.1	36.4	27.3	27.3
	2	161	16.8	29.2	28.6	25.5
	3	54	11.1	33.3	22.2	33.3
	4	49	4.1	24.5	38.8	32.7
	Subtotal	286	12.9	29.7	29.0	28.3
ISD	5	71	21.1	26.8	26.8	25.4
	6	40	42.5	27.5	15.0	15.0
	7	52	26.9	19.2	15.4	38.5
	8	188	50.5	25.0	10.6	13.8
	9	48	70.8	22.9	2.1	4.2
	Subtotal	399	43.9	24.6	13.5	18.0
PNP	10	-				
	11	48	77.1	10.4	8.3	4.2
	12	22	18.2	40.9	27.3	13.6
	13	12	33.3	16.7	33.3	16.7
	14	20	0	35.0	45.0	20.0
	15	7	14.3	42.9	0	42.9
	16	10	50.0	30.0	0	20.0
	Subtotal	119	42.9	24.4	19.3	13.4
Total		804	32.7	26.4	19.9	21.0

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Table 14

Percent of Located Children by Level of Functional Impairment in <u>Self-Care</u> Development

Agency Type	Project	Total	Level of Impairment			
			None	Mild	Moderate	Severe
	1	22	9.1	36.4	27.3	27.3
	2	161	18.0	26.7	29.2	26.1
	3	54	11.1	42.6	13.0	33.3
	4	48	2.1	29.2	33.3	35.4
	Subtotal	285	13.3	30.9	26.7	29.1
	5	71	16.9	18.3	36.6	28.2
	6	40	32.5	27.5	25.0	15.0
	7	52	36.5	17.3	9.6	36.5
	8	188	52.1	25.5	10.6	11.7
	9	48	68.8	25.0	4.2	2.1
	Subtotal	399	43.9	23.3	15.8	17.0
	10	-				
	11	48	85.4	8.3	4.2	2.1
	12	22	18.2	54.5	18.2	9.1
	13	12	0	41.7	41.7	16.7
	14	20	0	30.0	30.0	40.0
	15	7	14.3	57.1	14.3	14.3
	16	10	30.0	50.0	0	20.0
	Subtotal	119	41.2	30.3	15.1	13.4
Total		803	32.6	27.0	19.6	20.8

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Table 15

Percent of Located Children by
Level of Functional Impairment
in <u>Social</u> Development

Agency Type	Project	Total		Level of Impairment			
			None	Mild	Moderate	Severe	
MHMR	1	22	13.6	27.3	40.9	18.2	
	2	16?	21.1	28.0	29.2	21.7	
	3	54	9.3	38.9	18.5	33.3	
	4	49	2.0	28.6	30.6	38.8	
	Subtotal	286	15.0	30.1	28.3		26.6
ISD	5	71	16.9	25.4	28.2	29.6	
	6	40	17.5	45.0	22.5	15.0	
	7	52	48.1	15.4	5.8	30.8	
	8	189	59.3	23.3	9.5	7.9	
	9	48	64.6	18.8	14.6	2.1	
	Subtotal	400	46.7	24.3	14.2		14.8
PNP	10	-					
	11	48	79.2	10.4	8.3	2.1	
	12	22	40.9	36.4	22.7	0	
	13	12	25.0	41.7	33.3	0	
	14	20	15.0	35.0	40.0	10.0	
	15	7	14.3	42.9	28.6	14.3	
	16	10	10.0	50.0	20.0	20.0	
	Subtotal	119	46.2	27.7	21.0		5.0
Total		805	35.4	26.8	20.2		17.5

Table 16

Percent of Located Children by
Level of Functional Impairment
in <u>Cognitive</u> Development

| Agency Type | Project | Total | Level of Impairment | | | |
			None	Mild	Moderate	Severe
MHMR	1	22	9.1	31.8	40.9	18.2
	2	161	14.3	21.1	37.9	26.7
	3	54	7.4	37.0	22.2	33.3
	4	49	0	26.5	40.8	32.7
	Subtotal	286	10.1	25.9	35.7	28.3
ISD	5	71	12.7	23.9	28.2	35.2
	6	40	12.5	25.0	47.5	15.0
	7	52	26.9	15.4	21.2	36.5
	8	186	58.6	20.4	10.2	10.8
	9	48	50.0	25.0	18.8	6.3
	Subtotal	397	43.9	24.6	13.5	18.0
PNP	10	-				
	11	48	72.9	14.6	12.5	0
	12	20	5.0	45.0	45.0	5.0
	13	12	0	50.0	33.3	16.7
	14	20	20.0	40.0	15.0	25.0
	15	7	28.6	28.6	28.6	14.3
	16	10	10.0	60.0	10.0	20.0
	Subtotal	117	36.8	32.5	21.4	9.4
Total		800	29.1	24.6	25.6	20.6

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Table 17

Percent of Located Children by Level of Functional Impairment in <u>Language</u> Development

Agency Type	Project	Total	Level of Impairment			
			None	Mild	Moderate	Severe
MHMR	1	22	9.1	18.2	50.0	22.7
	2	161	8.1	26.7	37.9	27.3
	3	54	9.3	27.8	22.2	40.7
	4	49	0	20.4	42.9	36.7
	Subtotal	286	7.0	25.2	36.7	31.1
ISD	5	71	2.8	15.5	36.6	45.1
	6	40	7.5	22.5	45.0	25.0
	7	52	23.1	7.7	17.3	51.9
	8	188	31.4	33.5	16.0	19.1
	9	48	31.3	37.5	18.8	12.5
	Subtotal	399	22.8	26.3	23.1	27.8
PNP	10	-				
	11	47	0	17.0	53.2	29.8
	12	21	4.8	28.6	52.4	14.3
	13	12	8.3	25.0	41.7	25.0
	14	20	30.0	20.0	20.0	30.0
	15	7	0	0	71.4	28.6
	16	10	10.0	0	40.0	50.0
	Subtotal	117	7.7	17.9	46.2	28.2
Total		802	15.0	24.7	31.3	29.1

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The above suggested that language was the developmental area in which project personnel reported the greatest level of functional impairment, and comparison of the percent of children reported with moderate or severe levels of impairment, across all five areas of development, indicated that language was the area of greatest reported impairment. The percent of children with moderate or severe impairment levels was 40.9, 40.4, 37.7, 46.2, and 60.4, respectively for motor, self-care, socialization, cognition, and language (Tables 13-17). In other words, the reported frequency of moderate or severe language impairment at time of exit from sampled projects

"...LANGUAGE WAS THE AREA OF GREATEST REPORTED IMPAIRMENT."

was more than that of other developmental areas. There were no differences of consequence among the other areas of development.

Another trend in the data presented in Tables 13-17 was that MHMR projects reported a much smaller frequency of children with no impairement at time of project exit. The percents of children with no impairment reported by ISD and PNP projects were 40.2% and 35.0%, respectively, averaged across all five areas of development, but the same reported percent for MHMR projects was only 11.7% A $\underline{chi}$ square value ($\underline{X}^2$ = 48.95, df = 1, p <.001) showed that the observed and expected frequencies of children reported with no functional impairment differed significantly across types of sponsor agencies. Inspection of frequencies for each agency type found that the significant $\underline{X}^2$ was due to the occurrence of fewer than the expected number of children reported with no impairment in the MHMR pro-

jects and more than the expected number of children with no impairment. in the ISD projects.

There was no conclusive explanation for the above difference between MHMR projects and the remaining projects. One possible, albeit unlikely, explanation was that these projects were less successful in remediating impairments. A second explanation was that staff in MHMR projects had some unique and homogeneous perspective which caused them to rate functional impairment more severely than that rated by staff in the remaining projects. A third, and perhaps the most plausible, explanation was that the population served by MHMR projects was initially more severely impaired. Therefore, one would have expected the level of impairment at exit from MHMR projects to have been greater than that in the remaining projects (assuming that the degree of remediation was fairly constant across projects). This third and last explanation was supported somewhat by the data, since MHMR project staff reported a greater percent of multiply handicapped children (Table 11). However, there was no definitive basis for accepting any of the above explanations.

The reader should note that estimation of the reliability and validity of reported ratings of functional impairment was beyond the scope of this study. Ratings were assumed to have had an acceptable degree of content validity, and test-retest estimates of reliability would have been, in all probability, fairly high, since raters are typically consistent within themselves. The degree of interrater agreement, however, was not determined, and any rater effects were assumed to have been distributed randomly across projects. It is important also to bear in mind that the study did not require participants to provide supporting evidence for reported handicapping

information and ratings of functional impairment. It was assumed that the accuracy of reported information was within acceptable limits.

Information about the place of residence of located children showed that 94% resided at home with their natural parents or the extended family. This percent was consistent across all agency types. Two percent of located children were in foster homes, and four percent were in residential institutions.

In summary, descriptive information about 819 children located by the followup was available in terms of time since project exit, children's gender, ethnicity, handicapping conditions, and home residence. Chronological age of the children was not collected in order to minimize the data reporting task for participants in the study. Available information showed that the children located by the followup were 55% male and 51% Anglo. Only 4% of the children located were living in residential institutions.

Mental retardation, language delay, developmental delay, and orthopedic handicap accounted for about 75% of all primary handicaps. Project staff

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"THE LEVEL OF REPORTED FUNCTIONAL IMPAIRMENT IN LOCATED CHILDREN WAS AT THE MODERATE OR SEVERE LEVEL FOR ABOUT 40% OF THE CHILDREN IN MOST DEVELOPMENTAL AREAS..."

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reported that 64% of all located children were multiply handicapped, and MHMR projects reported significantly more multiply handicapped children than the remaining projects. The level of reported functional impairment in located children was at the moderate or severe level for about 40% of the children in most developmental areas, except in language develop-

ment where about 60% were said to have had a moderate or severe level of impairment at time of exit from sampled projects.

Another issue of generalizeability important to any followup study is the extent to which the population located in followup is representative of the total population served in the particular program being studied. The design of the current study did not address this issue directly, but the very high success rate experienced in locating children for followup greatly enhanced the value of the study in this regard.

As indicated by Table 2, followup was attempted for 87% of the children who met the criteria for followup eligibility, and 78% (see Table 3) of these were located in followup. In terms of actual children (Table 4), 1,204 were eligible for followup, and 819 children were located. (An additional 23 children were deceased, but descriptive information was not collected for these.) The number located (N=819) was 68% of the number eligible for followup, which represented more than two-thirds of the eligible followup population.

Of the 202 children who were not found in the followup (Table 4), 81 had moved out of the area. This was 40% of the unfound children. The remaining 121 children were "unknowns." There was no particular reason to

"...THERE WAS REASON TO BELIEVE THAT THE 819 CHILDREN LOCATED WERE REPRESENTATIVE OF ALL CHILDREN ELIGIBLE FOR FOLLOWUP."

have suspected that the children who moved were systematically different than the located children, but there may have been factors which systematically influenced whether or not a child ended up in the unknown group.

However, this group was only 10% of the population eligible for followup and did not represent a substantial portion of the population. Therefore, there was reason to believe that the 819 children located were representative of all children eligible for followup.

Placement and Service

One major question in the study centered about the place of service for children who had graduated from a birth through two project setting. Results showed that a major portion (77%) were receiving services in public schools (Table 18). Place of service also included parochial schools, but all further reference in this document will only cite public schools. Hence, the reader should note the assumed inclusion of parochial schools.

Results of the followup showed that 77% were attending a public school, 7% were attending a normal day care facility, 4% were in a special service center, 4% were in a residential institution, and 8% were receiving no services. The large percent of children found attending a public school (77%) and the very small percent served in a residential institution (4%) were considered very significant. These findings no doubt reflected, at least partially, the effectiveness of early intervention for handicapped infants and toddlers. As discussed earlier, the first Consortium research

"RESULTS OF FOLLOWUP SHOWED THAT 77% WERE ATTENDING A PUBLIC SCHOOL...4% WERE IN A RESIDENTIAL INSTITUTION..."

study indicated that early intervention provided by Consortium projects improved developmental progress (Macy Research Associates, 1978, p.111), and others concluded that early intervention was effective (Cornwell and

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Table 18

Percent of Located Children by Place of Service

Agency Type	Project	N	Public School	Normal Day Care	Special Service Center	Rsndtl. Inst.	None
MHMR	1	22	81.8	0	0	4.5	13.6
	2	159	71.7	13.8	1.3	13.2	0
	3	53	77.4	7.5	3.8	0	11.3
	4	51	88.2	3.9	0	0	7.8
	Subtotal	285	76.5	9.8	1.4	7.7	4.6
ISD	5	75	85.3	0	9.3	0	5.3
	6	39	76.9	5.1	5.1	0	12.8
	7	49	83.7	4.1	0	10	2.0
	8	195	73.8	12.3	4.6	1.	7.7
	9	47	53.2	0	0	2.1	44.7
	Subtotal	405	75.1	6.9	4.4	2.2	11.4
PNP	10	-					
	11	48	97.9	0	2.1	0	0
	12	15	73.3	0	20.0	0	6.7
	13	12	83.3	0	16.7	0	0
	14	20	90.0	0	10.0	0	0
	15	7	100.0	0	0	0	0
	16	10	50.0	20.0	10.0	0	20.0
	Subtotal	112	87.5	1.8	8.0	0	2.7
Total		802[a]	77.3	7.2	3.9	3.9	7.7

[a]Less than 819 due to missing placement information.

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Birch, 1969; Dicks-Mireaux, 1972; Carr, 1970; Garland, Stone, Swanson, & Woodruff, in press).

The above findings, in all probability, reflected changing public attitudes toward institutionalization and the greater openness of both parents and professionals toward alternative program options for handicapped infants and toddlers. It was likely that early intervention had impacted attitudinal areas as well, since projects typically included a parenting component and worked closely with both parents and professionals. It was thought that many parents and medical professionals might have opted for institutional placement of a handicapped infant shortly after birth had it not been for the counseling and awareness provided by an early intervention project. Research from the first Consortium study suggested that improvement in parental adjustment and acceptance of the handicapped child was one important benefit from early intervention (Macy Research Associates, 1978, pp. 88-97).

Another significant factor which contributed to the small percent (4%) of early intervention graduates placed in a residential institution was certainly the legal mandate of Public Law 94-142 for a free and appropriate public education for all handicapped children. Without such a mandate and associated national commitment to handicapped children, the opportunity for placement of early intervention graduates in public schools may well have been less, and the percent placed in residential institutions or special centers could have been much greater.

The large percent (77%) of early intervention graduates attending a public school and the small percent (4%) in a residential institution was perhaps more significant when considered in relation to the ratings

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of functional impairment at time of exit from an intervention project. The data reported in Table 13 show that 21% of located children were rated as severely impaired in the motor area. The percent of children rated severely impaired in the self-care, social, cognitive, and language areas was 21%, 18%, 21%, and 29%, respectively (Tables 14-17). While the follow-up found that only 4% of early intervention graduates were served in a residential placement, ratings of functional impairment indicated that a much larger percent of children would have been expected had there not been early intervention, improved awareness and attitudes, and legal mandates.

Followup results in terms of place of service found also that 8% of located children (Table 18) were receiving no special services. Pre-sumably, a certain number of children experienced successful remediation during early intervention and were no longer in need of services. Ratings of functional impairment at the time of project exit showed that 9.4% of the children located (N=77) had no impairment in any developmental area. This was nearly equal to the 8% found to have been receiving no services. These data suggest that, on the whole, special services were provided for those children in need of such services after graduation from an early intervention project. One should note that these data did not guarantee

"THESE DATA SUGGEST THAT, ON THE WHOLE, SPECIAL SERVICES WERE PROVIDED FOR THOSE CHILDREN IN NEED OF SUCH SERVICES AFTER GRADUATION FROM AN EARLY INTERVENTION PROJECT."

that every single child in need of services was receiving them, and of course, the study did not address the scope or quality of those services provided.

The percent in a public school setting was very consistent between MHMR and ISD projects (Table 18) but was somewhat higher in the private or nonprofit project category. In order to test a possible association between the type of sponsoring agency and place of service, at the time of followup, a 3 x 2 contingency table was constructed and a <u>chi</u> square statistic computed, according to the procedure described by Ferguson (1966, p.235ff). Table 19 presents this contingency table. The four place of service categories in Table 19, other than public school (normal day care, special service center, residential institution, and none), were collapsed into a single category termed nonschool, to distinguish these latter institutions from what is usually thought of as a public school for the mainstream of education. Of course, the place of service categories encompassed within the nonschool group included public institutions and institutions that provided school-type programs.

The <u>chi</u> square statistic ($X^2 = 7.82$; df = 2) was significant at less than the .05 level and indicated an association between the type of sponsor agency and place of service. A contingency coefficient (C) was selected to provide a descriptive measure of this association. Accordingly, C was computed by the following equation (Ferguson, 1966, p.235):

$$C = \sqrt{\frac{X^2}{N+X^2}}$$

The computed C value was only .10, which indicated an almost complete lack of association between type of sponsor agency and place of service, even though the <u>chi</u> square value was statistically significant. Hence, one may conclude that for all practical purposes, there was no association between type of sponsoring agency and place of service.

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Table 19

Number of Located Children in Contingency Table
for Type of Sponsor Agency and Place of Service

| Agency Type | Place of Service | | |
	Public School	Nonschool[a]	Total
MHMR	218	67	285
ISD	304	101	405
PNP	98	14	112
Total	620	182	802

[a]Includes normal day care, special service center, residential institution, and none.

A related question regarding place of service was its possible asso-
ciation with primary handicap of children. In other words, was there a

"...FOR ALL PRACTICAL PURPOSES, THERE WAS NO ASSOCIATION
BETWEEN TYPE OF SPONSORING AGENCY AND PLACE OF SERVICE."

tendency for children with certain handicaps to receive services in a
public school or nonschool setting? The answer was yes, but to a very
slight extent. Table 20 gives an 8 x 2 contingency table for primary
handicap and place of service. Three primary handicaps (emotionally dis-
turbed, autistic, and other) were collapsed into one category to yield
a total of eight primary handicap categories. As in the previous table,
the four nonschool place of service categories were collapsed into a
single nonschool category.

The computed chi square statistic for Table 20 (X^2 = 31.17, df = 7)
was significant at less than the .001 level. However, the contingency
coefficient was only equal to .20, which indicated a very weak association.
Inspection of observed and expected cell frequencies for the 8 x 2 con-
tingency table found that the significant chi square value was due essen-
tially to the handicap categories of retardation and hearing impaired. In
both cases, the number of children observed in the nonschool place of ser-
vices category was considerably less than expected. The reader should note,
however, that the actual association observed between primary handicap and
place of service, as measured by the contingency coefficient, was of little
practical significance.

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Table 20

Number of Located Children in Contingency Table for Primary Handicap and Place of Service

Primary Handicap	Place of Service		Total
	Public School	Nonschool[a]	
Retardation	147	26	173
Language delay	60	27	87
Developmental delay	176	67	243
Orthopedic	61	17	78
Other health impaired	38	17	55
Hearing impaired	67	3	70
Visually handicapped	23	4	27
Emotionally disturbed, autistic, and other	31	14	45
Total	603	175	778

[a]Includes normal day care, special service center, residential institution, and none.

The foregoing contingency table analyses regarding the relationship between place of service and two concomitant variables, type of sponsor agency and primary handicap, found no meaningful association between place of service and either concomitant variable. While the significant chi square values indicated the presence of a nonzero association, for both concomitant variables, the contingency coefficients showed that the associations were very weak, or in the case of place of service and type of sponsor agency, even trivial.

These findings indicate that the dependency between the type of agency sponsoring an early intervention project and the place of service after project exit or between a child's primary handicapping condition and place of service after early intervention was of no real concern.

"...ONE COULD EXPECT AN EARLY INTERVENTION GRADUATE TO HAVE THE SAME OPPORTUNITY OF RECEIVING SPECIAL SERVICE IN A PUBLIC SCHOOL OR NONSCHOOL SETTING...WITHOUT REGARD FOR THE TYPE OF AGENCY WHICH SPONSORED THE CHILD'S INTERVENTION PROJECT OR...THE CHILD'S PRIMARY HANDICAP."

From a practical standpoint, then, one could expect an early intervention graduate to have the same opportunity of receiving special service in a public school or nonschool setting (i.e., normal day care center, special service center, residential institution, or no service) without regard for the type of agency which sponsored the child's intervention project or without regard for the child's primary handicap.

The followup of early intervention graduates found several important outcomes relative to place of service. As noted in Table 18, 77% of

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located children were attending a public school, and this outcome provided a valuable estimate of the percent of handicapped children who leave early intervention projects and go on to regular or nonspecialized schools. A 99% confidence interval computed about the observed proportion (77%) ranged from 73% to 81%.

The confidence interval was computed according to the method described previously (Hays, 1963, p.291). If the study were to have sampled randomly the population of Texas children who graduated from early intervention projects, the observed value of 77% would have yielded a very good estimate of the post graduate placement of infants and toddlers. Even in spite of sampling restrictions, the study provided a valuable estimate of the percent of handicapped children (77%) who enter a public or parochial school after enrollment in an early intervention project.

"...THE STUDY PROVIDED A VALUABLE ESTIMATE OF THE PERCENT OF HANDICAPPED CHILDREN (77%) WHO ENTER A PUBLIC OR PAROCHIAL SCHOOL AFTER ENROLLMENT IN AN EARLY INTERVENTION PROJECT."

The study sought to determine the type of service placement for those children attending a public school. Table 21 presents these data for 612 located children. Overall, results showed that 59% were attending an early childhood special education class in a public school. This might at first appear to indicate that a significant proportion of early intervention graduates did not go on to some type of mainstream setting in the public school. However, in Texas special education services were available for three to five-year handicapped children, but public schooling was not

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Table 21

Number and Percent of Children Attending a Public School in Terms of Type of Service Placement

Agency Type		Regular School Program	Speech Only	Resource Room	Self-Con-tained	Early Childhood Special Class	Other	Total
MHMR	N	4	0	3	27	175	7	216
	%	1.9	0	1.4	12.5	81.0	3.2	35.3
ISD	N	69	11	23	46	132	19	300
	%	23.0	3.7	7.7	15.3	44.0	6.3	49.0
PNP	N	0	1	0	34	51	10	96
	%	0	1.0	0	35.4	53.1	10.4	15.7
Total	N	73	12	26	107	358	36	612
	%	11.9	2.0	4.2	17.5	58.5	5.9	100.0

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available for nonhandicapped children of similar age. Therefore, there was little or no opportunity for handicapped children in the three to five-age range to participate in any type of mainstream class setting. It was thought that many of the located children who were in early childhood special education classes would enter resource room placements when they reached five, six, seven, or more years of age.

While it was beyond the scope of the current study to determine future placements of these children, the reported data still provided a means for estimating placement of children once they reach five years or older. If one were to assume that all or most children who were enrolled in a service placement other than an early childhood special education class (Table 21) were five years or older, and consequently able to participate in the full range of special education program options, the data reported in Table 21 can be used to estimate the percent of early intervention graduates one might expect to see in the more complete range of special program options available to children age five years or older. Table 22 presents both the number observed and the estimated percents of children by type of service placement, excluding early childhood classes.

The estimated percents in Table 22 were computed by determining the percent of children observed in each service placement to the total number, excluding those in an early childhood special class. For example, there were 73 children observed in the regular school program, and this was 28.7% of the total number (N=254, excluding early childhood).

The above estimation procedure was tenuous at best, but evidence for its validity came from analysis of dates of exit from early intervention projects. These dates showed that children in early childhood special

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Table 22

Estimated Percent of Early Intervention
Graduates by Type of Service Placement
Based on Exclusion of Early Childhood Classes

	Regular School Program	Speech Only	Resource Room	Self-Contained	Other	Total
Number Observed [a]	73	12	26	107	36	254
Percent Estimated[b]	28.7%	4.8	10.1	42.2	14.2	100.0

[a] As reported in Table 21.

[b] Stepped up to 100% in proportion to observed numbers.

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education classes had exited most recently from an early intervention project, which suggested strongly that this group contained the youngest or most of the youngest children served in a public school. The median date of project exit for these children was August 1979. Consequently, these children would have had little or no opportunity to participate in mainstream settings, since their median age would have been about four years (assuming that children were three years of age at time of exit from a project and that data collection took place about one year after August 1979).

Table 23 reports median dates of exits for children by type of service placement, and these dates suggest that children in all service placement types except possibly for the 'other' category, were older than

"...RESULTS SUGGESTED THAT AT LEAST ABOUT 42% OF EARLY INTERVENTION GRADUATES WILL EXPERIENCE SELF-CONTAINED PLACEMENT AND AT LEAST ABOUT 29% WILL EXPERIENCE THE REGULAR SCHOOL PROGRAM TOTALLY AFTER ENTERING A PUBLIC SCHOOL."

those in early childhood classes. These findings suggested that the percent of early intervention graduates receiving service in an early childhood class (58.5%, Table 21) was due primarily to age rather than the inability of children to tolerate placement more nearly in the mainstream of education. Hence, the estimated placement percents given in Table 22 have a degree of credibility, and results suggested that at least about 42% of early intervention graduates will experience self-contained placement and at least about 29% will experience the regular school program

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Table 23

Median Dates of Project Exit for Children Served in a Public School

Type of Service Placement	Median Date of Exit	N
Regular school program	April 1977	72
Speech only	April 1978	12
Resource room	August 1976	25
Self-contained	May 1978	102
Early Childhood special class	August 1979	344
Other	May 1979	25
Total		580[a]

[a]Total does not agree with total of 612 in Table 21 due to missing dates for 32 children.

.totally after entering a public school.

The foregoing discussion about expected type of service placement must be understood in terms of one further consideration, which also involves the length of time since exit from an early intervention project. It may be that many early intervention graduates experienced a self-contained placement as their initial public school placement, but progressed to a resource room or the total regular program after one or two years in the public school. Because of this consideration, the estimated percent of children in a self-contained placement (42.2%, Table 22) can only be seen as a lower limit, since older children in other placements may have been previously in a self-contained placement. Dates of exit reported in Table 23 tended to reinforce this interpretation since children in the regular school program or the resource room were likely about a year older than those in the self-contained placement.

Data regarding type of service placement for children attending a public school were analyzed also to investigate possible association with type of sponsoring agency and with primary handicap. In both cases, the relationships were statistically significant, and the C coefficients, computed to provide a descriptive measure of association, indicated moderately weak relationships.

A 3 x 5 contingency table for the type of sponsor agency and the type of service placement was constructed from data reported in Table 21. The speech only and resource room service types were collapsed into one category in order to gain sufficiently large cell frequencies for computation of the chi square statistic. The chi square value was 143.09 and was significant at less than the .001 level (df=8), and the C coefficient was equal to .44.

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Comparison of observed and expected cell frequencies showed that the association between agency type and service placement type, among early intervention graduates served in a public school, was not due to one or even a few specific combinations. The percents reported in Table 21 indicated that 9% of children from MHMR projects and 88% from the PNP projects were receiving services in an early childhood special class or a self-contained class, but only 59% of children from the ISD projects were served in the same placement types.

The above results showed that there was some degree of meaningful association between type of sponsoring agency and type of service placement for those children served in a public school after graduation or exit from an early intervention project. Since the C coefficient was equal to .44, one might term the association mild or perhaps weak to moderate. The maximum value of the C coefficent was known to have been more than .71 and less than or equal to 1.00 (Ferguson, 1966, p. 236), but determination of the actual maximum value was beyond the scope of this study. Hence, one can see that the C coefficient indicated association of at least some consequence.

There were at least three possible explanations for the observed association between sponsor agency and service placement within the public school. One possibility was the large percent of multiply handicapped children followed by the MHMR projects. Data reported in Table 11 showed that children located from MHMR projects included a significantly greater percent of multiply handicapped children, and therefore a more restricted range of service placements may have been expected. However, this line of reasoning was weakened to some extent because the ISD and PNP projects

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were about equal in the percent of multiply handicapped children located, and therefore one would expect a similar range of service placements. However, this range of service placements was much greater for the ISD projects. Also, the PNP and MHMR projects were about equal in terms of range of service placements, but differed significantly in percent of multiply handicapped children located by the followup (see Tables 11 and 21).

The above pattern among sponsor agencies in terms of public school service placements and the percent of children located with multiple handicaps suggested that children from ISD projects may have had greater opportunity for transition to a wider range of service placements within a public school, by virtue of having been served previously in an ISD project setting. This explanation had some degree of intuitive appeal, but support for this explanation was not evident in the data collected.

The third and most plausible explanation pertained to variations in the age of children located, according to type of sponsor agency. Data from Tables 5 and 6 suggested that children located by followup from ISD projects were generally older (about 12 months) than those located by other projects. Therefore, one might have expected a wider range in service placements, since opportunity to experience variable types of service placements was partially a function of age. The early childhood special education class was the major placement option available to handicapped children up to the age of five or six years. Therefore, an older group of early intervention graduates, as was most likely the case for children from ISD projects, would have had more opportunity for varied service placements.

Analysis of median dates of project exit according to service place-
ment helped confirm this third explanation. Information presented in
Table 23 shows that children located in a public school early childhood
special class had the most recent median exit date, which implied that
these children made up the youngest service placement group. By the same,

"...CHILDREN LOCATED IN A PUBLIC SCHOOL EARLY CHILDHOOD
SPECIAL CLASS...MADE UP THE YOUNGEST SERVICE PLACEMENT GROUP."

token, median dates of exit for children in total regular school and re-
source room placements implied that these children were among the oldest.

By way of summary, there was some degree of association between
type of sponsor agency and service placement for children located in
public schools. The extent of association was not considered particularly
important. The most plausible explanation for this association was that
followup from ISD projects located an older group of children than did
followup from the MHMR and PNP projects, and a greater range of service
placements was available to the older children.

The foregoing analysis and discussion considered the association be-
tween type of sponsor agency and type of service placement. Another
association of interest was that between primary handicap and service
placement among children located in a public school. A 5 x 4 contingency
table was constructed to test the relationship between service placement and
primary handicap. In order to gain sufficiently large cell frequencies
for computation of the chi square statistic, the type of service place-

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ment termed 'other' was deleted, and the speech only and resource room placements were combined. Additionally, primary handicap categories

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"...THE SIGNIFICANT RELATIONSHIP BETWEEN PRIMARY HANDI-
CAP AND SERVICE PLACEMENT WAS NOT DUE TO ANY PARTICULAR COM-
BINATION OF HANDICAP AND PLACEMENT."

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with small frequencies were combined.

Table 24 presents the above 5 x 4 contingency table. The computed chi square value was 123.71, which was significant at less than the .001 level (df=12). The computed C coefficient was .43, which indicated a moderately weak relationship. Comparison of observed and expected cell frequencies showed that the significant relationship between primary handicap and service placement was not due to any particular combination of handicap and placement.

On one hand, the above results were not surprising, since one would expect a child's handicapping condition to influence the type of service placement. However, the degree of the relationship between primary handicap and placement was perhaps not as strong as might have been expected. The weakness in this observed relationship was likely due to the large number of children included in the developmental delay category and in the early childhood special class category. Neither of these categories was well defined in terms of the underlying measured concept (i.e., handicap or service placement), and discrimination among children likely was obscured. Such a condition would have reduced the strength of the relationship as measured by the C coefficient.

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Table 24

Number and Percent of Children Attending
a Public School in Terms of Primary
Handicap and Type of Service Placement

Primary Handicap		Regular School Program	Speech Only Or Resource Room	Self-Contained	Early Childhood Special Class	Total
Retardation	N	0	4	30	105	139
	%	0	10.5	29.4	30.2	
Language delay	N	19	7	0	33	59
	%	26.4	18.4	0	9.5	
Developmental delay	N	17	11	15	125	168
	%	23.6	28.9	14.7	35.9	
Ortho-pedic/, other health impaired	N	22	9	14	47	92
	%	30.6	23.7	13.7	13.5	
Remaining handi-caps[a]	N	14	7	43	38	102
	%	19.4	18.4	42.2	10.9	
Total	N	72	38	102	348	560
	%	100.0	100.0	100.0	100.0	

[a]Hearing impaired, visually handicapped, emotionally disturbed, autistic, and other.

Other questions of interest addressed by the data reported from the followup dealt with the level of functional impairment in children at the time of exit from an early intervention project and the subsequent place of service and type of service placement experienced by children. One would have expected more severely involved children to have been served in locations which provided more comprehensive services to handicapped children, and analysis of ratings of functional impairment (at project exit) supported this expection.

Tables 25 and 26 report the average rating of functional impairment within each developmental area for the place of service categories and type of service placements. Data presented in Table 25 show that children served in a residential institution had an overall rating of impairment of 3.63 which was the highest for any place of service category (larger ratings indicated more severe impairment). The next highest overall average impairment rating was 3.04 and was for special service community centers. Both of these locations provided comprehensive services and were seen as appropriate service locations for severely involved children. The service location with the lowest overall average rating of impairment in located children was the normal day care center (average rating = 1.30), and those children receiving no services had a somewhat higher rating of impairment. It was not clear why children receiving no service

"THE SERVICE LOCATION WITH THE LOWEST OVERALL AVERAGE RATING OF IMPAIRMENT IN LOCATED CHILDREN WAS THE NORMAL DAY CARE CENTER.;."

did not have the lowest impairment ratings, but ratings in the lower end of the scale likely indicated such mild handicap involvement that special

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Table 25

Average Ratings of Functional Impairment[a]
for Located Children by Place of Service[a]

Developmental Area	Public School			Normal Day Care Center			Special Service Comm. Center			Residential Institution			No Service		
	N	$\overline{X}$	SD	N	$\overline{X}$	SD	N	$\overline{X}$	SD	N	$\overline{X}$	SD	N	$\overline{X}$	SD
Motor	607	2.35	1.10	58	1.24	.54	31	3.13	.96	31	3.55	.62	60	1.63	.99
Self-Care	606	2.36	1.09	58	1.14	.35	31	3.03	1.05	31	3.61	.56	60	1.57	.93
Social	608	2.25	1.08	58	1.19	.40	31	2.87	1.09	31	3.58	.56	60	1.68	.91
Cognition	604	2.44	1.07	58	1.33	.47	31	3.00	1.21	31	3.68	.54	59	1.74	.98
Language	606	2.86	.97	58	1.60	.65	31	3.19	1.05	31	3.71	.46	59	2.00	1.02
Average		2.45			1.30			3.04			3.63			1.72	

[a] Rating scale: 1 = none, 2 = mild, 3 = moderate, 4 = severe.

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Table 26

Average Ratings of Functional Impairment by Type of Service Placement for Children Served in a Public School

Developmental Area	Regular School Program			Speech Only			Resource Room			Self-Contained			Early Childhood Special Class			Other		
	N	$\overline{X}$	SD	N	$\overline{X}$	SD	N	$\overline{X}$	SD	N	$\overline{X}$	SD	N	$\overline{X}$	SD	N	$\overline{X}$	SD
Motor	72	1.39	.70	12	1.33	.65	26	2.19	1.06	106	2.49	1.20	347	2.58	1.01	36	2.08	1.18
Self-Care	72	1.35	.58	12	1.33	.49	26	1.81	.85	106	2.49	1.26	346	2.64	.97	36	2.11	1.17
Social	72	1.21	.47	12	1.50	.67	26	1.65	.74	107	2.40	1.22	347	2.51	1.00	36	2.06	1.17
Cognition	72	1.29	.54	11	1.54	.69	26	1.96	.82	106	2.59	1.20	345	2.74	.93	36	2.11	1.14
Language	72	1.61	.64	12	2.33	.89	26	2.27	.92	106	3.44	.69	346	3.01	.85	36	2.69	.98
Average		1.37			1.61			1.98			2.68			2.70			2.21	

[a]Rating scale is the same as for Table 25.

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service was not seen as being critical by the children's parents or care-takers.

. Ratings of functional impairment relative to type of service placement revealed a pattern similar to that for place of service. Data reported in Table 26 indicates that children who were rated least severely impaired at project exit and who were found attending a public school were receiving services in the least restrictive service placements. Children served totally in the regular school program had the lowest overall average rating of impairment, and children served in the self-contained placement had next to the highest overall average rating of impairment (2.68). Children in the early childhood special class placement had the highest overall average impairment rating (2.70), but this was most likely due to the large percent of children from MHMR projects served in the early childhood place-

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"...CHILDREN SERVED IN THE SELF-CONTAINED PLACEMENT HAD NEXT TO THE HIGHEST OVERALL AVERAGE RATING OF IMPAIRMENT..."

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ment group (see Table 21). As discussed previously, these children in-cluded a significantly greater percent of moderately and severely impaired children than those from ISD or PNP projects, and this inflated the im-pairment ratings for this service placement group.

More detailed inspection of the data presented in Tables 25 and 26 also shows that ratings of functional impairment in located children were fairly consistent across all areas of development, except for the language area, where ratings indicated more severe impairment. This pattern of higher ratings in the language area was consistent with the pattern reported

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previously in Tables 13-17 and indicated that project personnel saw language as having been the area of greatest impairment at time of graduation or exit from early intervention.

Results of Cost Study

A second focus of the study was on the collection of information that could be used in a limited study of costs associated with early intervention for handicapped infants and toddlers. In accordance with this second focus, the sampled projects completed the single-page Cost Analysis Form (a copy of this cost form and standard instructions appears in the Appendix).

Cost information collected in the second phase of the study dealt only with immediate 1979-80 costs experienced by participating early intervention projects. As such, cost data did not pertain to any of the programs serving the children located by the followup.

The cost of services to handicapped infants and toddlers was of special concern, and so projects reported direct personnel costs associated with this early intervention. Since the cost analysis form requested salary in-

"COST INFORMATION COLLECTED...DEALT ONLY WITH IMMEDIATE 1979-80 COSTS EXPERIENCED BY PARTICIPATING EARLY INTERVENTION PROJECTS."

formation for specific professional positions, it was possible, to a limited extent, to study the cost of intervention per child relative to the intervention provided:

Table 27 reports cost information in terms of salaries and consultant fees expended for the birth through two handicapped population. Salary costs

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Table 27

Reported Personnel Costs and Computation
of the Total Personnel Cost for 1979-80
for Birth through Two Children

Agency Type	Project	Total Monthly Salaries	Months of Service	Total Annual Salaries	Consultant Fees	Total Personnel Cost
MHMR	1	$ 6,647.	12	$ 79,764	$ 1,189	$ 80,953
	2	17,218	12	206,616	0	206,616
	3	7,372	12	88,463	12,600	101,063
	4	41,517	12	498,204	6,000	504,204
ISD	5	16,176	9	145,584	3,000	148,584
	6	7,426	10	74,260	4,000	78,260
	7	2,384	12	38,614	150	28,764
	8	6,857	10	68,570	4,500	73,070
	9	7,300	10	73,000	1,400	74,400
PNP	10[a]	947	12	11,364	1,200	12,564
	11	8,002	11	88,022	0	88,022
	12	4,517	12	54,204	0	54,204
	13	2,832	11	31,152	1,200	32,352
	14	3,925	12	47,098	0	47,098
	15	6,309	9.5	59,936	560	60,496
	16	4,175	9	37,575	0	37,575

[a]This project did not contribute data to the followup portion of the study.

were computed by taking the summation of each employee's reported gross monthly salary multiplied times the percent of time committed to birth through two children. The total gross monthly salaries committed to birth through two children was then multiplied by the number of months of service provided by each project in order to arrive at the total annual salary costs for 1979-80. Consultant fees were added directly to the total annual salary costs, which yielded the total personnel costs for the birth through two population (1979-80).

Inspection of Table 27 shows that there was a wide range among projects in both total annual salary costs and consultant expenditures. The obvious factors affecting these costs were the size of the project and the extent of services provided. If other factors were equal, the project serving the most children presumably would have the largest personnel costs.

"...THERE WAS A WIDE RANGE AMONG PROJECTS IN BOTH TOTAL
ANNUAL SALARY COSTS AND CONSULTANT EXPENDITURES."

On the other hand, two projects could have served the same number of children and still have had vastly different personnel costs due to different levels of service provision. Of course, many other factors could have affected costs, and these will be discussed later.

Table 28 reports the number of children served and the total personnel cost in terms of cost per child per 12-month period. Since the length of service provision per year varied from 9 to 12 months among projects (see Table 1), it was necessary to extrapolate the cost per child to permit comparisons among projects. This extrapolation was done by

Table 28

Personnel Cost Per Child in 1979-80

Agency Type	Project	Total Personnel Cost (1979-80)[a]	N Served	Personnel Cost Per Child	Twelve-Month Personnel Cost Per Child
MHMR	1	$ 80,953	45	$1,799	$1,799
	2	206,616	130	1,589	1,589
	3	101,063	36	2,807	2,807
	4	504,204	284	1,775	1,775
ISD	5	148,584	85	1,748	2,331[b]
	6	78,260	35	2,236	2,683[b]
	7	28,764	13	2,213	2,213[b]
	8	73,070	202	362	434[b]
	9	74,400	22	3,382	4,058[b]
PNP	10	12,564	390	32	32[b]
	11	88,022	29	3,035	3,312[b]
	12	54,204	115	471	471[b]
	13	32,352	9	3,595	3,922[b]
	14	47,098	180	262	262[b]
	15	60,496	23	2,630	3,322[b]
	16	37,575	15	2,505	3,340[b]
Average		101,764	100.8	1,903	2,146.9
Standard deviation		117,493	111.8	1,126	1,318.2

[a] As reported in Table 1.

[b] Extrapolated to twelve months.

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dividing the cost per child by the number of months of service provided, to obtain an average monthly cost per child, which was multiplied by twelve to yield the extrapolated cost per child for a 12-month interval.

Total personnel cost per child (12 months) reported in Table 28 revealed a wide range among projects in personnel cost for service to the birth through two handicapped population. They ranged from $32 to $4,058 per child. The average cost per child was $2,147, and the median cost was $2,272 per child.

One of the first questions of major interest centered about the absolute cost of early intervention for the birth through two handicapped population.

"TOTAL PERSONNEL COST PER CHILD (12 MONTHS)...RANGED FROM $32 TO $4,058...THE MEDIAN COST WAS $2,272 PER CHILD."

population. The data collected in the current study provided one estimate of personnel cost. A 95% confidence interval fixed about the average cost per child observed in the current sample (N=16) showed that the lower and upper bounds to the interval were $1,501 and $2,793. The confidence interval limits were computed according to the following equation:

$$\overline{X} \pm 1.96 \ (SD \div \sqrt{N}).^{a}$$

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[a] $\overline{X}$ = the average cost per child, SD = standard deviation, N = number of projects sampled, and 1.96 is the z-value associated with the probability of .05 under the normal curve.

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The interpretation of a 95% confidence interval was that if 100 samples of N=16 were to have been selected randomly from a population of infant projects, 95 of the intervals computed for the 100 samples would have contained the average cost per child in the actual population. Hence, one can be fairly confident that in the population from which the current sample was drawn randomly, the actual average cost per child was contained within the interval bounded by $1,501 and $2,793.

One limitation of the current study was of course that the sample was not selected randomly from the population of infant projects in Texas, and so one cannot conclude necessarily that the above confidence interval applied to the population of Texas projects. Nevertheless, the average cost per child observed in the current study still provided a useful estimate, and the extent to which the sample represented infant projects in Texas was the extent to which the sampled average was applicable. Since the study included about 20% of the Texas infant projects and sampled across a wide range of sponsor agencies, the observed sample was considered fair and reasonably representative.

Evidence of the validity of the current sample as an estimate of average cost per child came from previous research and the National Diffusion Network (NDN). In the latter case, the median cost for nine similar projects approved by the Joint Dissemination Review Panel for national dissemination was $1,995 per child. Previous research conducted among Triple T Infant Consortium projects found that the median cost for nine Texas projects was $2,124 per child (Macy Research Associates, 1978). These median costs both compared favorably to the average and median costs of $2,147 and $2,272 per child observed in the current study.

One qualification that should be made regarding the above comparisons was that seven of the sixteen projects sampled in the current study were included also in the previous Texas Consortium study. This created some degree of overlap or dependence between samples in the first and second Consortium studies, and one would expect agreement, to some extent, between the cost estimates, regardless of the validity or invalidity of the current sample.

While previous cost figures indicated that personnel costs per child observed in the current study were reasonable, the effect of fiscal inflation during the past several years called for adjustment of the previous figures. Information based on the U. S. Consumer Price Index indicated the following annual rates of inflation[1] during the recent years:

1976	5.2%
1977	6.8%
1978	9.4%
1979	13.9%
1980	14.0% (est.)

Adjustment for inflation in the median annual cost per child observed in the first Consortium study resulted in a median annual cost per child of $2,858 for 1980.

The median annual cost per child from the sample of National Diffusion Network (NDN) projects was $1,995 per child (Far West Laboratory for Educa-

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[1] As reported by the Business and Technology Department, Dallas Public Library, Dallas, Texas.

tional Research and Development, 1979). Adjustment for inflation in the NDN sample was done individually by project to allow for the variable rates

> "ADJUSTMENT FOR INFLATION IN THE MEDIAN ANNUAL COST PER CHILD...IN THE FIRST CONSORTIUM STUDY RESULTED IN A MEDIAN ANNUAL COST PER CHILD OF $2,858 FOR 1980."

across different years. Inflation adjustments were computed by compounding the reported cost per child across the whole years from Joint Dissemination Review Panel (JDRP) approval through 1980. Table 29 gives the ad-

> "ADJUSTMENT FOR INFLATION IN THE NDN SAMPLE WAS DONE INDIVIDUALLY BY PROJECT...AND THE MEDIAN ADJUSTED COST PER CHILD WAS $2,597."

justed annual (12 month) cost per child for each NDN project, and the median adjusted cost per child was $2,597.

Table 30 compares information regarding estimates of the cost of early intervention per child and shows that personnel cost per child observed in the current study was, as expected, less than total cost per child (when adjusted for inflation) found in either the previous Consortium study or the NDN project sample. While personnel costs would have constituted the vast bulk of costs, there would still have been some additional costs for facilities, equipment, and so forth. However, the difference between estimates of personnel cost per child seemed rather large and probably was due to a lag between increments in salaries (especially those in the human services) and inflation effects in the Consumer Price

Table 29

Cost per Child Adjusted for Inflation for NDN Projects

Home State	Date of JDRP Approval	Reported Annual Cost per Child	Years Adjusted	Adjusted Annual Cost per Child
Missouri	11-77	$1,975	1978-80	$2,806
Wisconsin	10-75	821[a]	1976-80	1,310
Washington	9-75	2,100	1976-80	3,351
Illinois	2-79	2,000	1979-80	2,597
Texas	7-79	1,996[a]	1979-80	2,275
Utah	7-78	1,473[a]	1978-80	2,092
Oregon	9-77[b]	2,366	1978-80	3,361

[a]Extrapolated to 12 months.

[b]Date at conclusion of period in which costs were calculated. Date of JDRP approval was March 1978.

Table 30

Comparison of Estimates of Median Annual
Cost per Child for Early Intervention

Sample	Number Projects	Median Date of Cost Reporting[a]	Median Cost per Child (12 months)	
			Original	Adjusted for Inflation
National Diffusion Network	7	11-77	$1,995	$2,597
First Texas Consortium Study	9	2-78	$2,124	$2,858
Current Study	16	2-80	$2,272[b]	

[a]In the case of NDN projects, the JDRP approval date was taken as the date of cost reporting. In the case of the Texas Consortium studies, the middle of the fiscal year reported was taken as the median date of cost reporting for all projects.

[b]Reported cost was for personnel only and did not include facilities, equipment, or other related costs.

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Index. In other words, the rate of inflation in early intervention projects was likely not as great as in the rest of the national economy, so the inflation adjustment for cost per child may have been excessive.

The foregoing discussion considered estimates of the cost of early intervention for birth through two-year handicapped children. Another question of frequent interest addressed the cost effectiveness among selected projects or project models. Although cost effectiveness is an important issue, the design and limitations of the current study did not permit definitive comparisons among sampled projects. For example, one might review personnel costs per child reported in Table 28 and conclude

"ALTHOUGH COST EFFECTIVENESS IS AN IMPORTANT ISSUE, THE DESIGN AND LIMITATIONS OF THE CURRENT STUDY DID NOT PERMIT DEFINITIVE COMPARISONS AMONG SAMPLED PROJECTS."

that project nine, with a cost per child of more than $4,000, was the least cost effective, but meaningful analysis in terms of cost effectiveness would have required fairly precise measurement of the extent of services provided, and of the needs of the children served. Such measurement was beyond the scope of the current study.

For example, consider that the 12-month cost per child for project nine exceeded $4,000 and that the same costs for project ten were less than $50. This was a remarkable difference in costs and most assuredly reflected differences, at least in part, in the extent of services delivered and the severity and types of handicaps of the children. At least three dimensions could have impacted the extent of services. These were 1) the duration,

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2) range, and 3) frequency of service. Variations in all three dimen-
sions would affect costs, and any comparative study of cost effectiveness
would need to account for such variations.

Another factor relevant to cost effectiveness would be agency salary
schedules. One would have to account for salary differences across all
projects before attempting to evaluate the cost effectiveness of indi-
vidual projects. For example, one possible, albeit extremely unlikely,
explanation for the large difference in costs between projects nine and
ten ($4,058 and $32) could have been that the parent institution sponsoring
project nine had a very high salary schedule and that the converse was
true for project ten.

A final consideration must be variation in the service delivery
models implemented by projects. One intuitively believes that there are
efficient and inefficient ways of accomplishing the same task, and
presumably some models are inherently more cost effective than others. The
variability in costs reported in Tables 27 and 28 suggests that there could
have been differences in cost effectiveness, but the data did not permit
definitive conclusions regarding such issues.

As an example of the difficulty in making cost comparisons, suppose
that one attempted to compare project five to project eight (Table 28).
Both projects were sponsored by independent school districts, and project
five used a combination model of service delivery in both the home and pro-
ject center, whereas project eight delivered service in only the home.
The costs per child for project eight ($434) were quite small when com-
pared to project five ($2,331), but a home-based model frequently may
appear more cost effective than a center-based model. In a home-based

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model, project staff may have only one contact per week per child, thereby allowing the home-based staff to serve a much larger number of children. If the projects five and eight had been equated in terms of the duration, range, and frequency of service, as well as on other relevant factors such as salary schedules and needs of children served, costs per child might have been more nearly equal, or perhaps inverted.

One additional significant factor in terms of cost effectiveness and model variations was the amount of contributed or volunteer service which went into a model's service delivery. These services would need to have been included in cost comparisons even though they did not consume project monies. Research has shown that the amount of contributed service can be significant in early intervention projects (Macy Research Associates, 1978, p. 44-47), and such data would be important when comparing cost effectiveness.

The previous material dealt extensively with estimates of the cost of early intervention and with salient factors regarding cost effectiveness. A second important question asked what were the personnel resources expended per child in early intervention projects. In order to respond to this question, personnel position and percent of time committed to the birth through two population for all staff were summarized into the total number of Full Time Persons (FTPs) per project. Table 31 reports these data for each project.

The entries in Table 31 show that project one had one FTP in administration, one FTP in teaching, one-tenth FTP in physical therapy, and so forth. One FTP might have been one person with 100% commitment or two persons with 50% commitment or any combination totaling to 100% commit-

Table 31

Full Time Persons (FTPs) Committed to the Birth through Two Population[a]

Project	Administrative	Teacher	Speech	PT	OT	Nutritionist	Counselor	Case Worker	Appraisal	Nurse	Physician	Secretary	Aide	Driver	Consultant	Total FTP	Total Directed FTP
1	1.0	1.0	.10					1.33	.93		.33		.33		.06	5.08	1.43
2	3.0	7.5		1.0				2.0		.50			5.0	2.0		21.0	13.50
3	.20	4.0		1.0				1.0	.75	.30					.67	7.92	5.0
4	5.0	14.0	2.0	2.0		1.0		3.0	2.75			.50	1.0	5.0		36.25	19.0
5	.20	6.0										.90	6.0			13.10	12.0
6	.50	3.0	.25				.50			.50			3.0		.19	7.94	6.25
7		1.0	.15	.07	.05			.40		.01		.05			.01	1.74	1.27
8	1.0	3.0	.30	.10								1.0	2.0	1.0		8.40	5.4
9	1.0	2.0	1.0								1.0	1.0				6.00	3.0
10	.06				.24	.25				.03			.06		.06	.70	.55
11		4.0	.16	.16				.70	.60							5.62	4.32
12	1.0	3.0										1.0				5.00	3.00
13		.7	.50		.50								2.0		.10	3.80	3.70
14	.40		.75	.75	.75			.50			.10					3.25	2.25
15	1.0	.7	1.5	.65	1.0										.50	5.40	4.35
16	1.0	4.0													.05	5.00	4.00

[a] Table shows that project two had 7 1/2 teachers and 1/2 time nurse (among others) committed to the birth-two population.

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ment. Computation of consultant FTPs was less direct since projects re-
ported only total dollars expended on consultant fees. Total fees were

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"ON THE AVERAGE, THERE WERE .17 FULL TIME STAFF PERSONS
PER CHILD..."

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divided by a selected gross monthly salary to obtain the consultant
months purchased. This in turn was divided by the number of months
of service provided by the project in order to yield the percent of
commitment, which was expressed in terms of.FTPs.

- Total FTP represented the sum total of all persons committed full-
time-to. the. birth through two population within a given project. While
this figure provided a measure of committed resources, it also represented
all personnel including secretaries, project directors, bus drivers and
so forth. A more direct measure of committed resources was needed to
reflect more direct service to children. Thus, a directed FTP was com-
puted to include only those personnel thought most directly involved in
service provision. These personnel were the teacher, speech therapist,
physical therapist (PT), occupational therapist (OT), and aide. Table 31
presents both the total FTP and the total directed FTP for each project,
and, as expected, there was a wide range across projects in terms of total
and total directed FTP.

On the average, there were .17 full time staff persons per child and
.124 directed full time persons (teacher, speech therapist, physical and
occupational therapist, and aide) per child in sampled projects. However,
these data were not particularly relevant unless translated into hours

of time per child, and Table 32 reports hours of time per child as well. These computations were based on an 6-hour day and a 30-hour week

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"...ON THE AVERAGE, CHILDREN IN EARLY INTERVENTION PROJECTS RECEIVED 4.99 HOURS OF COMMITMENT FROM ALL PROJECT PERSONS PER WEEK OR 1.00 PER DAY."

(note that the length of the work day in individual projects was unknown; some projects may have been on a schedule other than the six-hour day).

Inspection of Table 32 shows that on the average, children in early intervention projects received 4.99 hours of commitment from all project persons per week or 1.00 hours per day. In terms of directed full time persons, children received an average of 3.72 hours of commitment per week or .74 hours per day. Upper and lower bounds for 95% confidence intervals for the average of 4.99 hours were 6.69 and 3.29; similar bounds for the average of 3.72 hours were 5.28 and 2.16.

One caution regarding Table 31 is that the data could not be taken as a very reliable measure of the range of services provided by individual projects. Inspection of the Appraisal column in Table 31 shows that only

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"IN TERMS OF DIRECTED FULL TIME PERSONS...(TEACHER, SPEECH THERAPIST, PHYSICAL AND OCCUPATIONAL THERAPIST, AND AIDE)...CHILDREN RECEIVED AN AVERAGE OF 3.72 HOURS OF COMMITMENT PER WEEK OR .74 HOURS PER DAY."

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four projects had FTP entries, but this did not indicate necessarily the absence of the appraisal function in the remaining projects. The

Table 32

Personnel Resources Expended Per Child

Agency Type	Project	N Served (79-80)	All Full Time Persons per Child	Per Child[a]		Directed Full Time Persons Per Child	Per Child[a]	
				Average Hours per Day	Average Hours per Week		Average Hours per Day	Average Hours per Week
MHMR	1	45	.11	.66	3.3	.032	.19	1.0
	2	130	.16	.96	4.8	.104	.62	3.1
	3	36	.22	1.32	6.6	.139	.83	4.2
	4	284	.13	.78	3.9	.067	.40	2.0
ISD	5	85	.15	.90	4.5	.141	.85	4.2
	6	35	.23	1.38	6.9	.179	1.07	5.4
	7	13	.13	.78	3.9	.098	.59	2.9
	8	202	.04	.24	1.2	.027	.16	.8
	9	22	.27	1.62	8.1	.136	.82	4.1
PNP	10	390	.00[b]	.01	.1	.001	.01	.1
	11	29	.18	1.08	5.4	.149	.89	4.5
	12	115	.04	.24	1.2	.026	.16	.8
	13	9	.42	2.52	12.6	.411	2.47	12.3
	14	180	.02	.12	.6	.012	.07	.4
	15	23	.23	1.38	6.9	.189	1.13	5.7
	16	15	.33	1.98	9.9	.267	1.60	8.0
Average			.17	1.00	4.99	.124	.74	3.72
Standard dev.			.12	.69	3.46	.107	.64	3.19

[a]Computations based on 6-hour day and 5-day week.

[b].002 when rounded to three places.

reason for this was that frequently other personnel assumed an appraisal function in addition to other duties. Mixed functions were not uncommon among project staff, and hence, the listing of positions was not a good measure of service range.

The foregoing results spoke to estimates of the cost of early intervention, but a much broader dimension was the cost and benefits realized within the comprehensive picture of special services for Handicapped children and adults. Followup results, discussed in the previous section of this report, show that the small percent (4%) of early intervention graduates served in a residential institution was less than might have been expected. A large percent of children located (77%) were attending a public school. The data further suggest that less than one-half (42%) of early intervention graduates will be served in a self-contained special class in school.

These results and other research demonstrating the effectiveness of early intervention strongly suggest that the initial cost of such intervention may be recovered, at least in part, over the long term through reduced costs for special services provided later in a child's life. That is, without early intervention for handicapped infants and toddlers, costs of special service provided later may be much higher. Garland, Stone, Swanson, and Woodruff (in press) reviewed existing research on the effective-

"THESE RESULTS AND OTHER RESEARCH DEMONSTRATING THE EFFECTIVENESS OF EARLY INTERVENTION STRONGLY SUGGEST THAT THE INITIAL COST OF SUCH INTERVENTION MAY BE RECOVERED, AT LEAST IN PART, OVER THE LONG TERM THROUGH REDUCED COSTS FOR SPECIAL SERVICES PROVIDED LATER IN A CHILD'S LIFE."

ness of early intervention and concluded that children experienced more efficient and successful use of special services after having received early intervention.

Further support for the conclusion that long range savings result from early intervention also comes from research done with disadvantaged children. Weber, Foster, and Weikart (1978) conducted an economic analysis of a preschool program and found that a substantial portion of the cost of preschool intervention for disadvantaged children was recovered by a later reduction in the need for more costly intervention. Lazar and Darlington (1978) studied data from eleven longitudinal studies of low-income children and concluded that early intervention for these children reduced the number of children enrolled in special education and the number retained in grade and improved academic achievement. Additionally, Braddock (1976) concluded that special education was cost effective in the long term.

A basic assumption is that special services for more severely handicapped children are more costly and that service delivery in a residential institution is the most costly means of providing special services. Brewer and Kakalik (1979, pp. 386-87) indicated that the cost of special services for a child with severe impairment was about double that for a mildly handicapped child. In terms of residential placement, Weber, Foster, and Weikart (1978, p. 46) found that the cost was at least twice that of a self-contained special class in a public school.

"THE COST ESTIMATES FOR EARLY INTERVENTION...ARE BEST INTERPRETED IN LIGHT OF POTENTIAL SAVINGS...FOLLOWUP RESULTS INDICATED THAT THESE LONG-TERM SAVINGS MAY BE SUBSTANTIAL."

The cost estimates for early intervention for handicapped infants reported in the current study are best interpreted in light of potential savings from reduced costs of special services provided in the long term. While the scope of the current study precluded estimation of these savings, followup results regarding place of service (e.g., residential compared to public school) and type of service placement (e.g., self-contained compared to resource room) indicated that these long-term savings may be substantial.

Summary and Conclusions

The Triple T Infant Consortium was formed in 1976 to increase aware-
ness about the importance of early intervention and to develop future
directives for programming handicapped infants in Texas. The Triple T
Consortium Followup Study described in this final report was the second
research effort undertaken by the Consortium and sought to provide infor-
mation which could be useful for policy formation in the area of special
service for handicapped infants and toddlers.

The primary focus of the followup study was the service placement
of infants and toddlers after graduation or exit from an early interven-
tion program. A secondary focus was on the cost of early intervention
for handicapped infants and toddlers. Early intervention projects invited
to participate in the study were those represented by the Triple T Con-
sortium membership. A total of 16 of 19 projects contacted agreed to
participate. The sample represented projects sponsored by local mental
health/mental retardation centers, local independent school districts,
and private and nonprofit centers. The total project sample represented
about 20% of all early intervention projects in Texas as of August 1980.

Data collection relied on the cooperation and assistance of personnel
in participating projects. Consequently, the study attempted to collect
data of high research value and of reasonable accessibility, so as not
to impose an unreasonable reporting task on participants. Data collec-
tion included two single-page survey forms. The first solicited descrip-
tive cost information about the participating project, and the second was
a child followup study sheet to be completed for each child for whom fol-
lowup was attempted.

Criteria for selecting children for followup were that children must have received at least six months of continuous service in the project, and children must have been three years or older as of September 1980. No criteria were defined for project graduation, and graduation was assumed to have been equivalent to exit from a project.

A total of 1,204 children met the criteria for followup, and personnel attempted to locate 1,044 (87%) of these early intervention graduates. Results of the followup found that projects were able to locate 78% of those attempted, 8% had moved, 2% were deceased, and the whereabouts of 12% were unknown. These results were remarkably consistent across the types of agencies sponsoring early intervention projects. The overall success rate for finding children after graduation from a project was 81% of the total attempted. (Success rate was defined as the percent located (78%) plus the percent deceased (2%). The discrepancy between 80% and 81% was due to rounding error. Unrounded percents were 78.4 and 2.2.)

Comparison of project exit dates to the date of followup found that followup was conducted within a few years after project exit. For more than three-fourths of the graduates, followup took place within three years after leaving the project. Children followed by ISD (independent school district) projects had been out of a project longer than those followed by MHMR (mental health/mental retardation) projects or PNP (private or nonprofit) projects.

Of the 819 children located by the followup, 55% were male, 51% were of Anglo ethnicity, 20% were Black, and 28% were Hispanic. Mental

retardation, language delay, developmental delay, and orthopedic impair-
ment accounted for three-fourths of all primary handicaps. The number
of children with multiple handicaps was 64% of all children located. The
percent of multiply handicapped children from MHMR, ISD, and PNP projects
was 85%, 53%, and 47%, respectively. There was no conclusive explanation
for the significant difference among types of sponsor agencies in terms
of the reported frequency of multiply handicapped children among those
children located by the followup. Additionally, MHMR projects reported
significantly fewer children, at the time of project exit, without any
functional impairment in the rated developmental areas. The reported
functional impairment in located children was at the moderate or severe
level for about 40% of the children in most developmental areas, except
in language where about 60% were reported at the moderate or severe level
at the time of exit from sampled projects.

One significant feature of the study was that the 819 children located
by the followup were probably representative of the total population eligible
for followup. The number located represented more than two-thirds of the
number eligible, and there were no known reasons for believing that the
remaining children who were not located differed substantially from those
located. Hence, conclusions based on the children located were considered
to have been applicable to all graduates from the sampled early interven-
tion projects.

One major finding of the study was that 77% of the early intervention
graduates followed were attending a public school. A 99% confidence in-
terval fixed about the observed value of 77% ranged from 73% to 81%, and
even in spite of sampling restrictions, the study provided a valuable

estimate of the percent of children who enter a public (or parochial) school program after an early intervention program.

Followup results further found that only 4% of the early intervention graduates located were in a residential institution. This was seen as especially significant in light of the relatively high percent (about 20%) of children rated as having been severely impaired at time of exit from an intervention project. The small percent of graduates institution-alized was attributed to several factors, including the effectiveness of early intervention projects as well as Public Law 94-142, which mandated free, appropriate public education for all handicapped children.

Another finding with significant implications for planning and development of early intervention projects was that there was essentially no relationship of consequence between place of service (that is, public school, normal day care center, special service center, residential institution, or other) and type of agency (MHMR, ISD, and PNP) which sponsored the intervention project. There was also no relationship between place of service and primary handicap of the child. In other words, the data indicated that one could expect an early intervention graduate to have the same opportunity of receiving special service in a public school or non-school setting regardless of the type of agency that sponsored the child's intervention project or the child's primary handicapping condition.

Results regarding the type of service placement within a public school setting were not conclusive because a large percent (59%) of children located were attending an early childhood special education class and had little or no opportunity for a wider range of service placement options. It was beyond the scope of the current study to determine future place-

. ments of children, but estimated percents based on reported data suggested that at least 42% of early intervention graduates would experience self-contained placement in a public school. It was estimated that at least 29% would experience a regular school program totally.

There was some relationship observed between type of agency sponsoring an early intervention project and type of service placement, but this was apparently due to age differences among children located by projects and likely did not reflect any systematic pattern in the overall service delivery system. As expected, primary handicap of followed children was related to service placement, but the strength of the relationship was surprisingly limited. It was thought that this was due to the large number of children with a handicap denoted as developmental delay and the large number of children in early childhood special classes. Neither of these categories was well defined, in terms of the underlying concept, and differences among children were likely obscured.

Ratings of functional impairment at the time of exit from a project confirmed the expectation that more severely handicapped children would have been served in service locations providing more comprehensive services and more restrictive service placements. Children served in residential institutions had the highest overall average rating, and children served totally in the regular program of a public school had the lowest overall average rating of impairment for the five areas of development.

Followup results in terms of place of service found also that 8% of located children were receiving no special services. Presumably, a certain number of children experienced successful remediation during intervention and were no longer in need of services. Ratings of functional impairment

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at the time of project exit showed that about 9% of the children located had no impairment, and this suggested that, on the whole, special services were provided for those children in need of such services after graduation from an early intervention project.

Cost information collected in the study dealt only with the immediate 1979-80 costs experienced by the sampled early intervention projects, and cost data did not pertain to any of the programs serving children located by the followup. The cost information studied was in terms of salaries and consultant fees, and did not include costs for facilities, equipment, and so forth.

The average personnel cost per child per year (12-months) was $2,147, and the median cost was $2,272 per child. These figures compared favorably to estimates of cost obtained from the previous Triple T Consortium study ($2,124 per child) and from early intervention projects in the National Diffusion Network ($1,995 per child). However, adjustment for inflation in the latter figures increased the estimate to $2,858 and $2,597 per child per year, respectively.

Personnel costs would have made up the bulk of cost per child, but the differences between the median personnel cost per child ($2,272) observed in the current study and between total costs adjusted for inflation ($2,858 and $2,597) were larger than expected. It was thought that the inflation rate in early intervention projects, especially as reflected in salary increases, was less than that indicated by the U. S. Consumer Price Index, and therefore inflation adjustments in cost per child may have been excessive.

A significant finding revealed in the cost data was the extreme diversity in cost per child among the projects. Total personnel cost per child per year ranged from $32 per child to $4,058 per child and reflected variability among projects in a number factors.

A question of high interest in any cost study usually pertained to cost effectiveness among alternative project models or intervention strategies. In the current study, design and limitations imposed by data collection constraints made it impossible to make comparisons of cost effectiveness among individual projects. Such comparisons would need to have adjusted project cost figures for several factors, including salary schedules, severity of handicaps served, and services provided.

Analysis of personnel resources expended per child also found wide variability among sampled projects. On the average, there were .17 full time project staff committed per child per week. This measure encompassed all staff, including bus drivers, project directors, teaching staff, secretaries, and so forth. When resources were restricted to just those personnel most directly involved in providing services to handicapped children, the average staff commitment was .124 persons per child. This latter resource group included only teachers, aides, and speech, physical, and occupational therapists.

Translation of the above average personnel commitments into a 30-hour week found that on the overall average, children received about five hours of commitment from all staff per week or about one hour per day. In terms of personnel most directly involved in service provision, children received an overall average of less than four hours per week or about three-quarters of an hour per day.

Followup results and other research demonstrating the effectiveness of early intervention for handicapped infants and toddlers suggested that the initial cost of intervention may be recovered, at least in part, over the long term through reduced costs for special services provided later. Other research reportedly showed that handicapped children experienced more efficient and successful use of special services after having received early intervention. While the scope of the current study precluded estimation of these long-term savings, followup results regarding place of service and type of service placement after graduation from early intervention indicated that these savings may be substantial.

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Appendix

To: Triple T Study Participant

Re: Early Intervention <u>cost analysis</u> directions

From: Consortium Task Force on Research Data

Dear Colleague,

The Triple T Consortium is undertaking a second research study in order possibly to obtain further support for early intervention for the handicapped. Our objective is to complete this study in time to provide input to the Texas Legislature prior to January, 1981, when it reconvenes.

The enclosed Cost Analysis Form is designed to collect consistent information about the cost of early intervention from a variety of service delivery settings. The information provided should permit computation of a fairly good estimate of the cost per handicapped child (0-2 years) per year and determination of the average cost currently experienced in Texas.

When completing the Cost Analysis Form, enter the most accurate data you can. However, it is not necessary to be extremely precise, and very good approximations will be sufficient.

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Cost Analysis Form
Triple T Consortium Study

Name of Agency/District _____ Date_____

How many children/adults were served in your agency/district during 1979-80? _____ _____

	AGE		
	birth thru 2 years	3 thru 22 years	23 years and older
Normal (if any)	_____	_____	_____
Handicapped	_____	_____	_____

For how many months out of the year are services available in your agency/district?

	birth thru 2 years	3 thru 22 years	23 years and older
Normal (if any)	_____	_____	_____
Handicapped	_____	_____	_____

What was the total 1979-80 annual budget for your agency/district?

Normal (if any) $_____ (across all ages)

Handicapped $_____ (across all ages)

What was the total number of full-time staff employed by your agency/district in 1979-80?

Professional   _____

Paraprofessional   _____

Secretarial/clerical _____

Custodial/support   _____

How many of the above professional and paraprofessional staff were assigned full-time to programs for the handicapped (regardless of age) in 1979-80?

Professional   _____

Paraprofessional   _____

Direct Personnel Costs (1979-80)

The following pertains only to those staff who deliver service directly to handicapped children age birth thru two years. Please list each staff by position and complete the monthly salary and percent of time devoted to birth thru two children. These staff should include teachers, aides, counselors, appraisal people, therapists, and so forth.

Position	Gross Monthly Salary	Percent Time (0-2 years)
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Consultant Fees (total for all handicapped children birth thru 2 Years) $ _____

To: Triple T Study Participant

Re: Directions for <u>Followup study</u> of early intervention graduates

From: Consortium Task Force on Research Data

Dear Colleague,

The Triple T Consortium is undertaking a second research
study in order possibly to obtain further support for early
intervention for the handicapped. Our objective is to complete
this study in time to provide input to the Texas Legislature
prior to January, 1981, when it reconvenes.

The enclosed Child Followup Study Sheets are designed to
collect consistent followup information about those children
who received early intervention but have now graduated on to
other programs or settings.

Please complete one study sheet for <u>each</u> child who was
in your project and who meets the following criteria:

1. Received at least six months of <u>continuous</u> inter-
    vention at some time during his or her enrollment
    in your project.

2. Will be three years or older as of September 1,
    1980 and therefore will be too old to be eligible
    for a birth through two program or setting.

Since followup study is usually rather difficult to
complete, the above criteria strives to give you considerable
latitude. Essentially, for followup you can select any child-
ren served (assuming six-months continuous service) at any time
during your project history and who will be too old for service
(assuming birth thru two Sept. 1 cutoff) <u>as of September 1,</u>
1980.

The <u>first step</u> is to identify those children who meet
the selection criteria. This will likely be a fairly large
number of children.

The <u>second step</u> is to find, as best you can, the current
whereabouts of these children and to identify the services
currently being provided. Presumably the number of children
located for complete followup will be less (and perhaps much
less) than those identified in step one.

The __third__ __step__ is to complete a Child Followup Study
Sheet for each child you located in step one. Note that the
followup sheet allows for followup information ranging from
unknown to complete placement description. Therefore, you
will be able to complete a followup sheet for each child,
but the extent of completeness will vary considerably across
different children.

Also note that all followup data are anonymous and you
are to assign each child a unique case number, beginning
with one and running up as high as needed. This case number
should be entered on the Child Followup Study Sheet.

Note: If your project serves children age three and older,
followup will be easier, since many may still be in your pro-
ject. If so, treat your project as the followup placement
for those children who "graduated" from the birth thru two
service component.

Case Number : ....

Child Followup Study Sheet
Triple T Consortium Study

Agency/District _____

Date of exit from your project _____ / _____
Month   Year

1 Unknown   2 Moved out of area   3 Deceased   4 Located

If located (number 4 is circled) complete remainder of page,
otherwise stop.

Current or Last Known Placement and Service (as of _____ / _____)
month   year

Place of Residence: 1 Home with natural parents or   Place of Service: 1 public/parochial school   If public/parochial school,
extended family   2 normal day care center   indicate type of service placement
2 foster home   3 special service community center
3 residential institution   4 residential institution   1 regular school   4 self contained
5 none-receiving no service   program (exclu-   5 early childhood
sively)   special class
2 speech only   6 other ..._ ...
3 resource room

Subject Description: M ___ F   Anglo Black Hispanic Other
Sex   Race

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Handicap (as last determined during your project service period)

	MR	Lang. Delay	Developmental Delay	Ortho-pedic	Other Health Impaired	Hearing Impaired	Visually Hand.	ED	Autistic	Other
Primary (circle one)	1	2	3	4	5	6	7	8	9	10
Other(s) (circle as needed)	1	2	2	4	5	6	7	8	9	10

How would you rate the level of functional impairment in each of the following areas in this child at the time of exit from your project or age three
as of September 1, 1980, if you serve an older population?

Area	No Impairment	Mildly Impaired	Moderately Impaired	Severely Impaired
motor	1	2	3	4
self-care	1	2	3	4
socialization	1	2	3	4
cognition	1	2	3	4
language	1	2	3	4

Followup Summary Sheet
Triple T Consortium Study

Name of Agency/District _____

Name of Project _____

_____ How many children met the selection criteria (from step one)?

_____ Of the above number of children, how many did you attempt to followup?

If the number followed is less than the number who met the selection
criteria, what basis did you use to choose the ones for whom followup
was attempted?

_____

When did your project begin service delivery to the birth thru two
handicapped population? _____/_____
                          Month   Year

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Table 32

Personnel Resources Expended Per Child

Agency Type	Project	N Served (79-80)	All Full Time Persons per Child	Per Child[a] Average Hours per Day	Per Child[a] Average Hours per Week	Directed Full Time Persons Per Child	Per Child[a] Average Hours per Day	Per Child[a] Average Hours per Week
MHMR	1	45	.11	.66	3.3	.032	.19	1.0
	2	130	.16	.96	4.8	.104	.62	3.1
	3	36	.22	1.32	6.6	.139	.83	4.2
	4	284	.13	.78	3.9	.067	.40	2.0
ISD	5	85	.15	.90	4.5	.141	.85	4.2
	6	35	.23	1.38	6.9	.179	1.07	5.4
	7	13	.13	.78	3.9	.098	.59	2.9
	8	202	.04	.24	1.2	.027	.16	.8
	9	22	.27	1.62	8.1	.136	.82	4.1
PNP	10	390	.00[b]	.01	.1	.001	.01	.1
	11	29	.18	1.08	5.4	.149	.89	4.5
	12	115	.04	.24	1.2	.026	.16	.8
	13	9	.42	2.52	12.6	.411	2.47	12.3
	14	180	.02	.12	.6	.012	.07	.4
	15	23	.23	1.38	6.9	.189	1.13	5.7
	16	15	.33	1.98	9.9	.267	1.60	8.0
Average			.17	1.00	4.99	.124	.74	3.72
Standard dev.			.12	.69	3.46	.107	.64	3.19

[a]Computations based on 6-hour day and 5-day week.

[b].002 when rounded to three places.